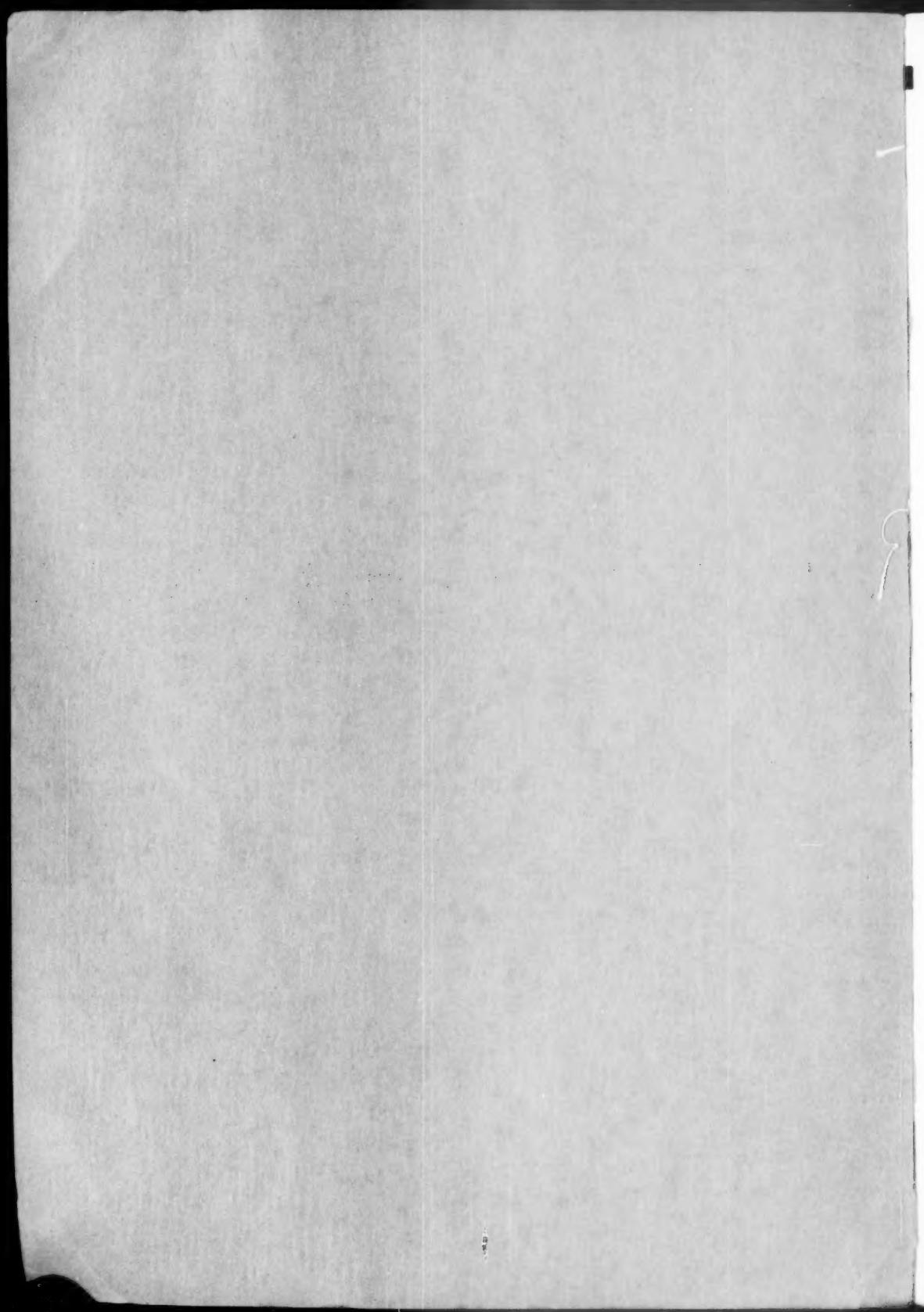


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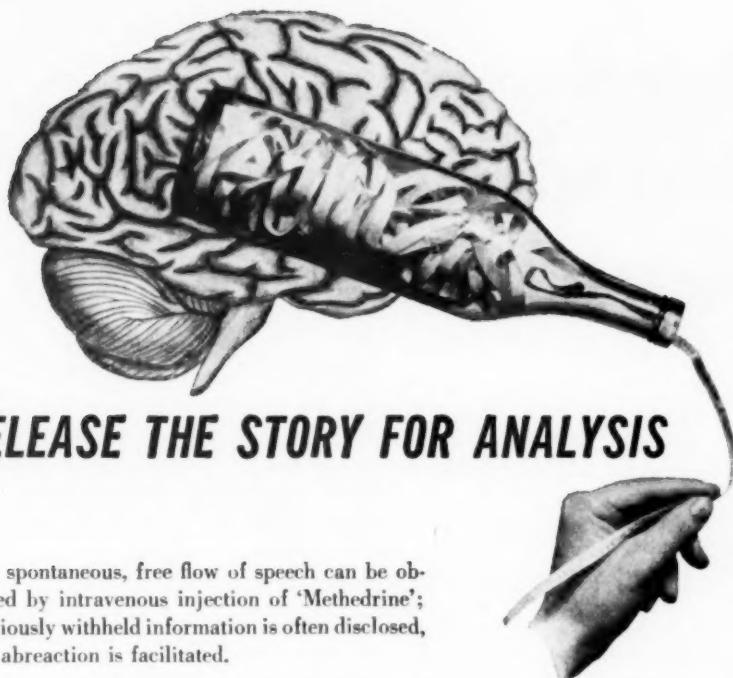
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TRAUMATIC WAR NEUROSES FIVE YEARS LATER¹

SAMUEL FUTTERMAN, M.D., AND EUGENE PUMPIAN-MINDLIN, M.D.
Los Angeles, Calif.

Since the inception of the Veterans Administration Mental Hygiene Clinic in Los Angeles, cases of traumatic war neuroses have formed an important group among our patients. In a recent survey of the last 200 closed cases in 1950, 20 (10%) could be classified as traumatic war neuroses. It is significant that even at this late date, 5 years after the end of the war, we still encounter fresh cases that have never sought treatment until the present time.

Most striking is the underlying stereotypy of the symptom picture of this condition. The patients still present the same symptomatology as was seen immediately after the war. In many of our cases symptoms have persisted unchanged since they first began. In others there have been periods of lesser or greater remission with recurrences precipitated by external, anxiety-laden situations. The primary symptoms shown by our patients almost without exception include the following: intense anxiety, recurrent battle dreams, startle reaction to sudden or loud noises, tension, depression, guilt, and a tendency to sudden, explosive, aggressive reactions. Superimposed upon this picture are secondary symptoms resulting therefrom, such as a tendency to avoid people, fear of exposure to any type of criticism, difficulty in making decisions, and various types of sleep disturbances. One finds also occasional conversion symptoms and various disturbances of the autonomic nervous system. In addition, varying secondary neurotic elaborations develop, which depend upon the previous character development.

The symptoms presented must be thought of in terms of abortive attempts at self-cure

through a reliving of the original danger in small doses in an effort gradually to master the threat and ultimately remove the conflict. It has been observed that mild traumatic states with similar symptomatology are almost universal among combat troops immediately after battle. But these symptoms usually subside within a few days.

In those cases that go on to develop the full-blown picture, which we are discussing here, the trauma combines with elements already present within the patient. Upon his return to civilian life the patient constantly re-experiences the feelings engendered in combat. The threat of annihilation and destruction that was very real and imminent under combat conditions is carried over into civilian life, which is then experienced as equally threatening. Thus the patient reacts to seemingly minor stimuli and seemingly innocuous situations in civilian life as if he were still under combat conditions. This we have seen graphically since June 1950, the outbreak of the Korean war. A good number of traumatic war neuroses that had never before had treatment appeared at our clinic. We have also noted that a number of our cases that had previously improved under treatment returned with a reactivation of their symptoms.

In the course of our rather extensive experience with the traumatic war neuroses, we have made certain observations that have not been previously noted in the literature. In this presentation we shall attempt to focus upon these aspects. It is not our intention to review and evaluate the massive literature that has appeared on this subject. We have therefore not included any specific bibliographical references. But certain oft-repeated statements have not been confirmed by our experience, and certain hitherto neglected or unmentioned phenomena appear to us to be of significance in the genesis of the traumatic war neurosis. These observations have direct bearing on the technique of psy-

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chotherapy in such cases and thus are of practical significance.

On the basis of our experience we have been able to differentiate the responses of 2 different character types that, when exposed to certain traumatic conditions, eventuated in a traumatic war neurosis. It is apparently necessary to have a combination of accidental circumstances superimposed upon a receptive soil in order to precipitate an overt, chronic traumatic war neurosis. Our material does not clarify the problem of what specific character structure predisposes to traumatic war neurosis. However, we wish to demonstrate the need for a different therapeutic approach to the 2 general types of underlying character that we found in our patients.

First we should like to present some of the hitherto unmentioned accidental predisposing factors and later discuss their significance in therapy.

CLINICAL OBSERVATIONS

In the first place we have noted that the traumatic war neurosis tends to occur with greater frequency among certain groups of noncombatant personnel. Those particularly affected were exposed to the violent effects and results of combat, but were not direct active participants therein. For example, medical first-aid men who were often in the thick of combat, but who did not carry weapons and were not able to defend themselves or take aggressive action against the enemy, represent a sizeable group among our cases. These men witnessed the deaths of and injuries to their comrades but were unable to take direct action in retaliation. Other representative groups include the soldiers in graves registration units and in air corps emergency fire squad units. Their work included the assembling of mutilated bodies, the identification of fragments of bodies, or the removal of burned bodies from wreckage, etc. Common to this whole group is the fact that no effective retaliatory action against the enemy could be taken to discharge the emotions engendered in them.

A staff sergeant in a graves registration unit had the grim duty of identifying parts of dead bodies and preparing them for burial. During the last 6 months of overseas' duty he developed the symptoms of a traumatic war neurosis, with frequent

vomiting spells and hoarseness. Following his discharge, he felt guilty about not having completed his job of burying the unknown dead.

During the first few interviews, the patient spoke about his overseas experiences in a low hoarse voice. Without emotion he spoke of burying men who were difficult to identify, of removing parts of dismembered bodies from burning planes, of identifying bits of bodies by the dog-tags alone. During this time he had fears that one of the bodies he uncovered might be that of one of his brothers, 2 of whom were serving in the same theatre of operations. On 2 occasions he identified friends from his neighborhood at home with whom he had gone to school. "I cried more than once. I used to get mad but I held it in me." In his outfit, some of the men under his command came from well-to-do families. After several months, these soldiers called attention to the increasing hoarseness of his voice. He stated, "These fellows caused me a lot of trouble. They were better educated than I was. Sometimes I felt ashamed. Once in a while they would sarcastically throw a long word at me which I didn't know just to make me feel bad. I got throwing-up spells about this time. I was tense and nervous and had trouble sleeping."

During the first 6 or 7 interviews the patient expressed, for the first time, his feelings toward other men in the service and his hostility toward civilians. He discussed, at length, many of the traumatic experiences that were so disturbing to him. About this time he appeared at an interview and spoke in a loud clear voice, in contrast to the initial hoarseness. He stated that he had been feeling very well for the last few days. He explained that after his last interview he had had a coughing spell, spat up a blotch of blood and mucus and noted immediate improvement in his voice. "I guess I felt self-assured and like I used to feel a long time ago." With continued treatment his other symptoms gradually subsided.

A second hitherto unnoted factor prevalent among our patients was that of guilt around killing, injuring, or striking a defenseless enemy. As long as the killing of enemy soldiers was done during active combat when it was a question of either "kill or be killed" there was relatively little guilt created. However, if enemy soldiers or noncombatants were shot when they were unarmed, or unprepared for the attack, or while in a seemingly defenseless position, great guilt was engendered. This was true with regard to the removal of prisoners of war to the rear, the shooting of a sniper in a defenseless position, or the accidental or deliberate killing of noncombatants. At such times, apparently, the military code and superimposed group conscience, which gave permission to kill or destroy under certain circumstances, was

quickly dissipated and replaced by the usual civilian morale and conscience, which places sharp limits on such impulses. Under such circumstances, conflict and guilt were quickly generated, and difficult to master.

A captured German officer slapped a sergeant who had been ordered to search him. The sergeant became angry and knocked the officer down. Following this incident the sergeant developed marked feelings of guilt about what he had done, which eventuated in the typical picture of a traumatic war neurosis.

In therapy, no amount of confrontation with the reality that his act had been justified helped the patient. He constantly returned to his strong self-reproaches. Only later, when this incident could be linked with his past history in relation to guilt feelings toward the parental figures, could the patient accept an objective evaluation of the insignificance of his act.

It has often been stated that there is an antithetical relation between physical injury and the development of a neurotic reaction. However, we have found a relatively high frequency of combat neuroses that developed following hospitalization for medical or surgical reasons. In other words, the tacit assumption that injury binds anxiety is not confirmed in our observations. In fact, it should be noted that the very fact of a physical injury may create guilt because of the conscious or unconscious wish for a wound in order to be removed from combat. This wish for some type of physical wound, either inflicted by the enemy or self-inflicted, was not uncommon among combat soldiers. Our cases include soldiers in both categories.

It appears to us that one significant factor promoting the development of the combat neurosis is the loss of group morale when the injured soldier was removed from his unit and placed in the passive environment of the hospital. A further factor that tended to promote breakdown even more than hospitalization alone was that of physical immobilization. When, for example, a fracture necessitated complete passive immobilization over a prolonged period, the lack of possibility of any type of action created fertile ground for the neurotic reaction. The momentum of the hostility engendered by contact with the enemy demanded some motor discharge. When this became impossible, it was turned inward against the individual or directed toward his own army rather than

toward the enemy. This was apparently true whether the immobilization was necessitated by physical injury or was medically induced by the doctor's orders for complete bed-rest. The resulting idleness prevented any adequate discharge and caused the individual to fall back upon earlier regressive patterns of defense against overwhelming stimuli.

A combat infantryman who landed in Normandie on D-Day went through 3 weeks of sustained combat with the unfulfilled promise of relief after each attack. Later, while on an outing, his leg was fractured when his jeep ran into a ditch. During hospitalization for the fracture, he developed a typical traumatic war neurosis with combat dreams, stammering, tension, suicidal ideas, etc. When seen 4 years after the accident he still had his original symptoms as well as a marked limp of the injured leg. With therapy his limp disappeared and his symptomatology cleared.

A former salesman, 44 years of age, with a successful career in the Navy had to be hospitalized for a herniorrhaphy. Following the operation he pleaded with his medical officer to be permitted out of bed immediately. He was told that unless he remained in bed, for a period of 6 weeks, he would have a recurrence of the hernia. During this period of enforced bed-rest, he developed a typical severe combat neurosis with tremendous anxiety and guilt that persisted almost unchanged.

Although our material confirms the statement that if stammering had occurred in the pre-army life of the soldier it could be reactivated by trauma or combat, we would like to add that we have observed this symptom in cases in which no previous history of stammering could be established. This is at variance with the prevalent opinions expressed in the literature.

A patient with no history of any speech difficulty prior to service developed a stammer as part of his combat neurosis, which yielded to therapy at our clinic. After this symptom had disappeared, the patient attended a wrestling match with his father. He became nauseated and stammered for a few days. The wrestling match suggested to him overwhelming aggression, which he could not face or control. In association he recalled a war experience in which a defenseless enemy soldier had been beaten unmercifully at his instigation.

THERAPEUTIC APPLICATIONS

In the light of our experiences we have also found it necessary to reevaluate our previous concepts regarding the technique of therapy with cases of traumatic war neuroses.

We have noted one striking feature in all our cases, which we feel is of great practical importance in therapy. This is the positive overidealization of the preservice adjustment of the patient. It has frequently been noted that patients with traumatic neuroses have a strong need to repeat both in dreams and in therapy the precipitating traumatic experiences as well as those associatively related to them. It is as if they live in the ever-present repetition of the traumatic experience that so overwhelmed them.

The pretraumatic and preservice histories as given by the patient are usually characterized by the lack of many of the common difficulties and conflicts that we are accustomed to find in neurotic patients. The patient with a traumatic war neurosis appears on the surface to have been a well-adjusted individual who broke down in face of an overwhelming trauma. In detailing his background the patient usually presents a relatively benign picture of good family interrelations, school adjustment, work record, and sexual and marital adjustment. All this is interspersed with acrid comparisons to the patient's present trials and tribulations, which seem to him all the more bitter to accept because everything was previously so fine.

One almost gets the impression that the patient is consciously distorting or at least minimizing his previous difficulties in order to impress the therapist with the nature of his illness and its relation to his traumatic experiences. It is not felt that the desire for compensation plays a predominant role in motivating this distortion. As one works with different cases of this type, one realizes that this overidealization of the past serves a definite defensive function in the patient's neurotic structure. The ego's ability to master the environment has been violently shattered by the traumatic event. The world is now a dangerous, frightening, constantly threatening place. The resultant anxiety is great. Defensively, the ego overidealizes the pretraumatic period in an attempt to find for itself some stability, some security, some fixed point of reference in this threatening environment. We might add that this overidealization serves not only a defensive but a constructive function as well. It represents a partial attempt to recapture the ego

strengths that were present before and sets a goal toward which the patient strives.

The monotonous repetition of the traumatic events is so characteristic of the true traumatic war neurosis that it may be considered a diagnostic criterion. We have found that the therapist must be able to accept this repetition for a considerable period of time, without irritation and without much effort to relate it to the past. In the experience of numerous therapists in our clinic the usual duration of this period is about 20 interviews. At most the therapist may intimate in the course of the therapeutic session that a certain conflict may be related to something in the patient's pretraumatic life, but without pressure or attempt to direct actively the patient's attention thereto. In this initial period he must not attempt to divert the patient from the need to repeat the same incidents over and over again. Here it is of great therapeutic significance to pay careful attention to even slight variations in the narration of the traumatic events. While their broad outlines remain the same, minor changes frequently occur. These are of significance in furnishing clues with regard to the symbolic significance of the event to the patient. They represent the points that are most closely linked to the past, and are therefore most easily colored thereby. Later in therapy they may be used to permit the transition to the pretraumatic events if this is indicated.

We have also noted in many cases that, after numerous repetitions, the character of the account has subtly changed so that it tends to become less devastating to the patient. This change in character may be taken as an indication of the patient's willingness now to relate the traumatic experience to other events.

A 26-year-old married veteran who had had combat duty did not develop any symptoms of a traumatic war neurosis until after his discharge. His presenting complaints were of anxiety, irritability, rapid heart beat, combat dreams, headaches, fears of riding in elevators and of the dark, and an obsessive fear of killing his child. He was seen both in individual and in group therapy. He was the only child of a dominant hostile father whom he feared, and a hypochondriacal mother. Following service he failed in numerous jobs mainly because he could not get along with his employers or his co-workers.

In therapy he was demanding and hostile. He finally expressed much bitterness toward his parents,

calling them "monsters." In one dramatic group session he spoke of throwing a hand grenade into a fox hole and later finding a dead German soldier in it. As he talked of this incident he interspersed comments about his father in such a way that the members of the group asked him whether he was talking of his father or of the German soldier. In the individual session that followed, he became aware of the relation between his childhood insecurity and inability to express hostility on the one hand and his combat breakdown on the other. He could recognize his hostility as a reaction to the frustrated need for affection from his parents.

An important aspect of the permissiveness of the therapist with regard to the need to repeat traumatic events and to isolate them from past and present occurrences in the patient's life relates to the establishment of a firm relationship between patient and therapist. At times it may seem as if the patient is testing the therapist by going over the same material to see if he will be accepted on this basis.

Our observations regarding the nature of dreams parallel those with regard to the consciously recalled traumatic experiences. At first, the dreams are stereotype repetitions of the traumatic events, usually in the form of nightmares, from which the patient awakens in terror at the point at which he was overwhelmed or felt he would be annihilated. While they may be precipitated by daily events, these have little impact on the character of the dream. As the treatment progresses slowly, these dreams also change in one of several directions: (1) Immediate events, unrelated to the traumatic event, become interwoven in the previously unadulterated traumatic dream. (2) The terror-laden affect diminishes, without change in the character of the dream. (3) The end of the dream, previously interrupted by awakening at the point of annihilation, is slowly modified in the direction of a partial (later complete) mastery of the traumatic event.

A 27-year-old veteran with considerable combat experience complained of the usual symptoms of a traumatic war neurosis. He reported a repetitive combat dream in which he was engaged in a tank battle that never ended and left him feeling tense and anxious. The dream had its exact counterpart in reality. He had always feared being taken prisoner of war during battle, and what the enemy would do to him. After actually being taken a prisoner of war, he ruminated over his feelings during his battle experiences. However, he always

felt that he could not find the proper answers for his reactions to these situations. He tried various different endings for the dream and for his actual experiences but something always seemed to be missing.

Much later in the therapy, after considerable ventilation of his war and prisoner-of-war experiences, he reported that his repetitive dream had now changed and that a solution had come to him in his last dream about the tank battle. Now in the dream he again went through the combat experiences and captured 2 German prisoners as he had done in reality. He had disarmed them before taking them for interrogation. While with them (both in reality and in the dream) he thought that insects were buzzing about his ears. In this dream he finally recognized that they were bullets that his prisoners were shooting at him after he thought he had taken away all their arms. He realized then that when he was captured he was very much afraid that he would be shot down as some Americans had shot German prisoners. However, he had not permitted his prisoners to be shot, although on other occasions he had not stopped his company from shooting other prisoners. He felt that perhaps this was the reason there had been no retaliation when he was captured. He was able to recognize that he had had impulses to kill his captured German prisoners and had suppressed them, but still felt guilt about them.

Following the feeling that he had finally found a satisfactory conclusion to the dream it disappeared.

Because of the importance of the establishment of a firm, deep relationship between patient and therapist, the use of intravenous narcosis and hypnosis has gradually diminished in our clinic. We have found that abreaction of traumatic events occurs without intravenous narcosis or hypnosis in the course of regular interviews. It must be remembered that many of our cases are of long duration and that we did not see them immediately after their traumata but only months or even years later. However, even in the earliest period, our experience with these techniques yielded no better results than without their use.

In reviewing our material we noted that our cases fell into 2 categories: (1) those who interrupted therapy after 20 or 30 interviews and (2) those who continued for longer periods of time. Examining these 2 groups to see if there were any distinguishing factors we were able to determine that the first group usually interrupted at the point at which some degree of mastery over the symptoms of the traumatic neurosis had been achieved. This was usually accomplished therapeutically by removing the iso-

lation of the traumatic events from present feelings. With the establishment of the relation of combat to present reality and present reality to combat, some degree of ego mastery and reintegration was brought about. At this point the transition to the correlation of the traumatic to pretraumatic events usually became evident both to patient and therapist. In this first group the patients interrupted, not wishing to proceed to this correlation. They continued to deny or minimize any relation to their past, and consciously withdrew from therapy.

The second group, on the other hand, accepted the relation to their past much more readily, began to modify their accounts of their past life, and admitted previous problems and difficulties that they had glossed over before.

We then scrutinized these 2 groups, so different in their therapeutic reactions, to see if there were any characteristics that would help us differentiate them further.

Our case material revealed that the underlying character structures differed markedly in the 2 groups. Patients in the first group, who interrupted treatment, were characterized by tendencies to act out their tensions and frustrations in an alloplastic manner. They drank more freely than others and permitted themselves greater sexual freedom than usual. Their work usually involved muscular activity of one kind or another. They tended to have a strong active interest in sports. These individuals, who could not live for any length of time with their anxieties, entered service with the feeling that nothing would happen to them. We found in them the "illusion of inviolability" that made them particularly vulnerable to even minor wounds, which shattered their illusion.

But even without wounds, the guilt, death, and violent disruption of interpersonal relations that characterizes the combat situation soon broke through their relatively brittle defensive barriers with a resultant traumatic war neurosis.

With the breakdown and the resultant disintegration of the ego, great fear that the previous adjustment could not be reconstituted became manifest. Therapeutically one attempts in these cases to work with the

interrelations between the present feelings and the combat situation and the reverse. In this way some reintegration could occur. The patient could reconstitute his old defense pattern of tension discharge and neither demanded nor wished for further investigation. This type of individual, in general, creates difficulties in therapy because of this tendency to act out the discharge tensions quickly.

A 28-year-old married veteran came to the clinic 3½ years after discharge with severe headaches, varied somatic pains, muscular spasms, general irritability, inability to concentrate at school, insomnia, suicidal thoughts, psoriasis, and vivid combat dreams. He served 4 years as an army medical corpsman of which 2½ years were with advance units in the Pacific. His traumatic experiences included scenes of cannibalism, rape of little girls, and much contact with dying men, mutilated bodies, etc.

He came from a large, poverty-stricken family and a broken home. He left school at 17, drank heavily, and led a somewhat promiscuous life. He was employed as a construction worker. He was able to avoid anxiety by acting out.

At the beginning of treatment he ventilated his feelings of hostility and frustration around his combat experiences and toward humanity. Combat dreams were present and the civilian dreams had quick associations to combat situations. Present situations were related to combat conflicts; for example, once while walking through a tunnel with his wife he met 3 Mexicans. He felt faint and unreal. The Mexicans reminded him of Japanese soldiers. He re-experienced the same feelings he had had while in combat. He felt helpless and frightened in the dimly lit tunnel as though he might be jumped upon or stabbed.

Termination was accomplished after about 20 interviews by spacing of further interviews. Essentially the treatment centered on the present feelings as they related to combat experiences. The role of the therapist was that of a superego figure who recognized and encouraged the patient's right to feel aggressive in a civilian situation, whereupon much of his anxiety and guilt was alleviated. He was able to ventilate, channelize, and clarify enough hostility to achieve a relative degree of mastery over the pent-up anxiety from the diffuse hostility that had produced the symptoms.

The second group, on the other hand, tended to remain in therapy longer. They made the transition to the correlation with their pretraumatic history after about 20 to 30 interviews. In contrast to the first group, this group might be characterized as inhibited, or autoplasic. They lacked the usual ability to disperse tensions. Their work was mainly of the white-collar type,

their sexual lives were inhibited, and there was little participation in sports.

A 25-year-old veteran went through about 7 months of continuous combat in the European Theatre until he was hospitalized. In addition to the usual symptomatology he had a slight stutter and a number of somatic complaints. The patient served as a medical aid man with an engineering unit. He received several citations for his work. His combat dreams were repetitive relivings of actual incidents. He related many horrible experiences including watching Germans bash in the heads of civilians while he was hidden in the cellar of a house in a town that had been suddenly recaptured by the enemy, watching civilian homes being blown up or shelled by artillery while the occupants were still in the house, and many horrible experiences with buddies whose lives he could not save. One particularly vivid experience that played a great role was that of finding a woman's body slashed, especially around the genitals. At times he seemed to relive these experiences in a hypnagogic state, even using the present tense.

The past history of the patient revealed that he had been an inhibited, overconscientious, meek individual who entered service shortly after graduating from high school. He was the youngest of 4 siblings with none of whom he had ever been close. The father was a weak, passive individual and the mother a rigid, controlling person who demanded conformity and obedience. He had always been shy with girls. He married an immature woman after service. This was the only girl-friend he had ever had.

During the initial period of therapy the patient went over and over his numerous horrible experiences. Outstanding was the fact that they dwelt so completely upon sadistic incidents. As he ventilated these he began to be able to assert himself in reality to a greater extent than before. It was not until much later in therapy, after the patient had been able to adjust fairly well in his present reality and work through the sadistic war experiences, that he admitted that throughout adolescence he had spent many hours in involved sexual fantasies of an extremely sadistic torturing type. It was at this point that the treatment no longer consisted of the handling of the traumatic war neurosis but dealt rather with the underlying sadomasochistic character structure.

We feel on the basis of this differentiation that each case must be evaluated from the point of view of the underlying character, and therapy directed accordingly. In the first group one centers therapy around the relation of the trauma to the present situation of the patient and does not correlate, except occasionally, with the pretraumatic background. In the second group one can go beyond this point to a real correlation with the earlier experiences and to a more complete

insightful resolution of the patient's difficulties.

SUMMARY

This paper presents a summary of our experiences with a large group of cases of traumatic war neurosis during the 5-year period since the end of the war. We have made certain observations that have been hitherto unreported and that we feel have both theoretical and practical therapeutic significance.

1. Traumatic war neuroses occur in non-combatant military personnel located in a combat area with a relatively high degree of frequency. This group is vulnerable because they are exposed to traumata without the possibility of effective motor discharge of the emotions thereby engendered.

2. Guilt about killing or assaulting defenseless enemy personnel, either military or civilian, is an important factor in the precipitation of a traumatic war neurosis. In such instances the superimposed military code (superego) yields to the earlier and stronger civilian prohibition against violence toward others.

3. Traumatic war neurosis can and does occur in conjunction with physical injury. Separation from the unit because of physical injury removes the influence of group morale, which serves as a deterrent to neurotic breakdown.

4. Physical injury or medical or surgical disorder that leads to enforced immobilization seems to encourage the development of the traumatic war neurosis by depriving the individual of the possibility of discharge of tension through motor activity.

5. Speech disturbances such as stammering can occur in cases of traumatic war neurosis without any evidence of this disorder having existed previously.

6. An overidealization of the pretraumatic history occurs in cases of traumatic war neurosis. This is viewed as a defensive maneuver of the ego in its effort to find some stable point in a world that has become overwhelming and threatening to the patient.

7. The monotonous repetition of the traumatic war experiences and combat dreams in cases of traumatic war neurosis is caused by the transformation of the world into a

threatening place. The patient reacts to civilian life as if he were still in combat.

8. Changes in the details of the repetitive traumatic experiences and the combat dreams are significant indicators of the points at which the traumatic experiences are linked with pretraumatic experiences.

9. In our experience, the use of intravenous narcosis or hypnosis has not been particularly helpful in cases of chronic traumatic war neurosis. This is due to the need for developing a firm relationship with the patient because of his feeling regarding the threatening nature of his environment and the people therein.

10. We have differentiated 2 character groups among our cases of traumatic war neurosis, according to their pretraumatic adjustment. We have characterized them as alloplastic and autoplastic, or outgoing and inhibited. In the alloplastic, therapy is usually relatively short and consists essentially of relating combat experiences to present feelings and attitudes. In the autoplastic, a further step can be taken beyond this in that

the traumatic experiences are related not merely to their present feelings and attitudes but also to the pretraumatic experiences. We feel that this differentiation is important particularly from a practical therapeutic point of view.

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LONG-TERM STUDY OF COMBAT AREA SCHIZOPHRENIC REACTIONS¹

PRELIMINARY REPORT

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The present study was undertaken to evaluate the long-term course of schizophrenia and schizophrenic-like reactions in individuals who were hospitalized in an isolated combat area in New Guinea during World War II. A main objective was the clarification of the pathogenesis of the illness and the factors conducive to good adjustment or difficulties in adjustment after return to the United States. Another purpose was to understand the differences between chronic deteriorating schizophrenia and episodic forms of the illness as well as in delineating those who displayed schizophrenic-like behavior in military service but in whom long-term observation might fail to substantiate the diagnosis of psychosis. It was further desired to obtain knowledge of the illness that might yield information for planning the neuropsychiatric program for selection and management of neuropsychiatric disorders in any future emergency.

METHOD

One hundred patients with schizophrenia or schizophrenic-like syndromes have been studied. These patients are a part of a group previously described in a broader survey of the psychopathology encountered (1). The first observations were made and recorded by the authors in an army general hospital that received patients who were participating in campaigns in New Guinea and the Philippines from 1943 to 1945. The patients had been subjected to special en-

vironmental stresses. Mail from home arrived irregularly and usually after an interval of weeks or even months. Furthermore, when news of illnesses, deaths, and infidelities was received, it was impossible to take any direct action. There were no furloughs and little opportunity for recreation. Rodent and insect pests were numerous, annoying and sometimes dangerous. The tropical heat was oppressive, especially when exertion was necessary. The food, although usually of sufficient quantity, was unappetizing and of inferior quality. About one-half of the men in this study had taken part in active combat, and most of the others had been subjected to periodic bombing attacks.

Further investigation of the course of the illness over a period of 5 to 8 years under different circumstances has permitted observation of an experiment of nature and evaluation of the prognostic significance of schizophrenic manifestations occurring in this special army setting. Personal follow-up interviews and individualized questionnaires have been used. In addition Army and Veterans Administration medical records have been made available. The American Red Cross has aided in locating individuals and obtaining information. In the evaluation, consideration has been given to the personality, background, type of reaction to the stressful situation overseas, and the adjustment on return to the usual problems of civilian life. It is planned to continue the study further to include more individuals and to analyze the background and adjustment of a control group of men who were in a similar situation but did not develop psychotic syndromes during wartime service overseas.

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BACKGROUND DATA

Data on the group give information about the characteristics of the patients' back-

grounds. Three-fourths were in the 20 to 30 age group. The incidence of schizophrenia decreased with increase in age. Sixty-six percent were white, 29% Negro, and 5% Mexican. The Negro patients have been discussed in some detail in a previous report (2). In one-fourth of the cases one or both parents were foreign-born. In one-half there had been serious disruption in the home because of death, separation, divorce, or mental illness of a parent. A history of personality maladjustment in close relatives was found in two-thirds of the patients. Approximately one-fourth had had less than an eighth grade education. One-half had finished the eighth grade or had some high school education, and one-fourth had finished high school or had some college experience. About one-half had made a fair or good overt school adjustment, and the other half had had definite problems. On direct questioning possibly significant deviations in childhood behavior were found in the following number of cases: enuresis after age of five, 36; nightmares, 36; nail biting, 33; fear of the dark, 26; temper tantrums, 26; excessive dependency on parents, 23; and sleep-walking, 21.

The group did not fall into any single prepsychotic personality category. The following characteristics were most commonly present to an excessive degree: anxiety, emotional lability, irritability, difficulty in assuming responsibility, self-consciousness, feelings of inadequacy, dependence on others, difficulty in dealing with aggressive drives, bodily preoccupation, impulsiveness, wishful thinking, reserved or withdrawn behavior, and difficulty in accepting criticism.

Slightly over half were in unskilled occupations and most of the others in semiskilled jobs. About one-half had been steady workers. The others were irregular workers, were still students, or had never been employed.

In regard to the use of alcohol, 28% had been abstainers, 44% moderate drinkers, and 18% excessive drinkers. In 10% no evaluation could be made. Thirteen percent had had previous psychotic illnesses and half of the others had manifested definite psychopathologic symptoms.

ILLNESS OVERSEAS

During the period of initial observation the following symptoms were present in one-fifth or more of the patients:

Confusion in thinking.....	72
Defective judgment	65
Auditory hallucinations	62
Inappropriate affect	50
Depression	52
Insomnia	51
Seclusiveness	47
Suspiciousness	44
Inappropriate behavior	40
Excessive fantasy and autistic preoccupation.....	40
Visual hallucinations	40
Headaches	39
Negativistic behavior	39
Tremulousness or twitching.....	38
Tension	36
Irritability and short temper.....	32
Restlessness	32
Apprehension	31
Difficulty in concentration.....	31
Excitement or agitation.....	30
Disorientation	29
Nightmares	28
Ideas of reference.....	26
Memory defect	25
Somatic delusions	25
Periods of dejection.....	25
Hypochondriacal complaints	24
Circumstantiality and irrelevance of talking and writing	22
Psychomotor retardation	21
Suicidal thoughts	21
Destructiveness	20

At the time of hospitalization overseas 6% had been in the army less than a year, 26% for 1 to 2 years, 50% for 2 to 3 years, 15% for 3 to 4 years, and 3% over four years. Approximately one-half had been overseas a year or less, and one-half had been overseas for over a year before hospital admission. Three-quarters of the patients were hospitalized overseas for less than 2 months. Almost one-half had become ill while engaged in combat. About one-fourth had serious family worries. Among the most common other possible precipitating factors were sexual conflicts, prolonged period overseas, difficulty in accepting responsibility, dissatisfaction with the army assignment, and problems in interpersonal relationships with others in the organization.

An evaluation was made of the degree of precipitating stress and the predisposition. An estimation of the part that personality

predisposition played in the illness was based on the personality characteristics and ability to adjust prior to the illness for which the patient was hospitalized overseas. The evaluation of the precipitating stress depended on the strength of the general reaction among the men exposed to it. This method of making a distinction minimizes the importance of personal sensitivities to emotional trauma. It is evident that this division can be but an approximation. The classification of the men into 3 categories of precipitating stress and predisposition is given in Table 1.

TABLE 1
CLASSIFICATION BY PREDISPOSITION AND
PRECIPITATING STRESS

Precipitating stress	Predisposition			Total
	Great	Moderate	Mild	
Great	8	20	13	41
Moderate	12	13	10	35
Mild	10	7	7	24
—	—	—	—	—
Total ...	30	40	30	100

TABLE 2
HOSPITALIZATION AFTER RETURN TO THE
UNITED STATES

(Excluding Recurrences)

1 month or less.....	10
1 to 2 months	29
2 to 3 months	30
3 to 4 months	9
4 to 5 months	4
5 to 6 months	4
6 to 12 months	5
More than 12 months.....	4
Unknown	5

FOLLOW-UP DATA

As soon as there was a tentative diagnosis of schizophrenia, arrangements were made for evacuation to the United States. Eighty percent of the patients were evacuated in 2 months or less. By the time the patients reached the first hospital in the United States, one-fifth had improved. A small number showed an intensification of symptoms. The time spent in the hospital before the initial discharge is shown in Table 2.

It is seen that after 2 months of hospitalization in the United States over a third of the patients had been discharged and that

only 4 were continuously hospitalized for more than a year.

Table 3 gives a comparison between the postwar and prewar adjustment considering the social, family, sexual, and economic aspects. The figures given in this table indicate that there is a definite trend toward poorer adjustment. The general health, the ability to function at work, the family relationships, and the social adaptation were all less satisfactory. There appeared to be no essential change in sexual adjustment. These findings are in substantial agreement with McDaniel and Diamond, who reported that over 50% of a group of discharged neuro-psychiatric casualties exhibited essentially the same behavior pattern as they had before entry into the service (3).

TABLE 3
COMPARISON OF POSTWAR TO PREWAR ADJUSTMENT

	% improved	% unchanged	% less satisfactory
Family	12	67	21
Social	16	43	41
Sexual	23	54	23
Economic	13	46	41
Health	4	66	30

The most prominent factor that seemed conducive to promoting a good adjustment was a warm, tolerant, helpful attitude on the part of a wife or other member of the family. Other factors, such as a satisfactory work situation and success in school and social contacts, appeared to be significant in a few cases. When the above factors were deleterious, their harmful influence was of relatively the same significance.

Table 4 gives an evaluation of the degree of disability during the follow-up period. This table indicates that with time there was a trend toward gradual decrease in disability as measured by an estimate of the total functioning capacity. Five or more years after discharge from the army, over a third (largely those with catatonic syndromes) have little if any social disability. However, it should be noted that many of these, although functioning well, showed minor personality deviations characteristic of schizophrenia. Disability was severe in 20 patients. Five of these were being cared for in a

psychiatric hospital. Fifteen had had definite exacerbations of their illness but had remained at home, and 11 had had attacks that had required one or more further hospitalizations.

At the time of the last follow-up, the following symptoms had most commonly persisted: vague somatic complaints, irritability, headaches, seclusiveness, insomnia, difficulty in concentration, dejection, excessive fantasy, suspiciousness, fatigability, anxiety, defective judgment, restlessness,

and the individual felt that the compensation was not deserved.

COMMENT

During the 5 to 8-year period of follow-up evaluation, in most cases the acute florid symptoms of schizophrenia had subsided. A high percentage continued to show evidences of a chronic schizophrenic state with neither progression nor regression of symptoms. A small group showed excellent remissions and a small group recurrent attacks. There was less deterioration than is usually found in schizophrenia among civilians who are hospitalized. However, the rigid requirements of adjustment in the army made it necessary for many mild cases to be admitted to a hospital. Many patients in the present group, had they not entered the army, might have remained as ambulatory schizophrenics.

In some cases, especially in those who were making a fairly adequate adjustment, the diagnosis was changed to some type of psychoneurosis after return to the United States but was later frequently changed again to schizophrenia. Careful scrutiny of the mental status of these individuals indicated that it was of a schizophrenic type. Such features as evasiveness, suspiciousness, illogical thinking, circumstantiality, lack of depth of emotion, talking beside or beyond the point, excessive fantasy life, and difficulty in dealing with concrete problems brought into focus the prominence of schizophrenic disorganization. Although the patients tried to cooperate well, they frequently were unable to give adequate information about themselves either by questionnaire or personal interview. In a few cases this was due to poor intellectual endowment; however, more commonly it was an evidence of the continuing schizophrenic symptomatology. These findings bring into focus the chronic nature of the illness of those developing schizophrenic disorders overseas. They also lend support to the view that schizophrenia in the military service does not differ essentially from that occurring in civilian life and contradict the conception held by some that schizophrenic syndromes evidenced in the military service are of different

TABLE 4
DEGREE OF DISABILITY

Degree	Length of time after discharge				
	1 year	2 years	3 years	4 years	5 or more years
Marked	48	28	22	23	20
Moderate	38	46	46	33	35
Mild	8	19	20	25	20
None	3	4	8	13	16
Unknown	3	3	4	6	9
Total ...	100	100	100	100	100

TABLE 5
COMPENSATION RECEIVED

Compensation	At beginning	At last follow-up
100%	34	9
60-70%	15	4
40-50%	28	10
20-30%	14	23
10%	2	31
0%	3	20
Unknown	4	3

paranoid delusions, lack of interest in surroundings, hallucinations, and resentment toward authority.

Table 5 shows the compensation first received from the Veterans Administration and that received at the time of the last follow-up 5 to 8 years later. These figures show that at the beginning over a third of the patients were receiving 100% disability compensation and only 3 no compensation. Five to 8 years later only 9 were still receiving 100%, about a third of the men 10%, and one-fifth no compensation. Investigation of the attitude toward compensation revealed that 58% felt that they should be getting more and 41% felt that they were receiving fair compensation. A single individ-

character and are cured by relief from the stressful military situation.

Prior to the illness diagnosed as schizophrenia, some had shown predominantly schizoid characteristics; some had manifested psychoneurotic symptomatology; and others had had a high incidence of so-called "psychopathic" traits, especially poor judgment, lack of ability to assume responsibility, failure to profit by experience, and impulsive behavior. In most of those who had developed psychoses in the setting of psychopathic characteristics, the earlier symptoms appeared to be a part of a schizophrenic disintegration. In addition, many others with the conventional characteristics of the psychopathic personality were found to be peculiarly susceptible to the development of psychotic reactions under circumstances of feeling trapped by the restrictions and discipline of army life(4).

The incapacity to deal with frustration, as emphasized by Jenkins(5), occurred in many of the patients. They did not have a normally well-organized pattern for dealing with life, which is usually accompanied by toleration of frustration and a plan for working out their problems. Analysis of the reason for steady employment prior to entering the army, which often was inappropriate to the educational background, revealed that the individual felt comfortable in work to which he had become accustomed and which he was afraid to leave to accept a position that might be an advancement but would require the assumption of greater responsibility. A large number appeared to be able to cope with a simple routine of life that did not require a challenge of adaptation. In civilian life they could find their particular niche. In the army there has to be more conformity and adaptation to the milieu. In other words, in civilian life the individual can find a comfortable pattern; in the army he has to feel comfortable in the given pattern.

This point may be illustrated by one patient who had worked in a leather factory in Brooklyn for 20 years. A little machine had been buzzing in his head but had not interfered with his simple routine work and returning home every night to eat dinner prepared by his mother and then going to bed. In the army, calisthenics and drill speeded up the machine so that the buzzing became unbearable. When he told his fellow-soldiers about it,

they lacked the tolerance of his mother and sent him to sick call.

A number of schizophrenics may even be able to capitalize on their schizophrenia if they have sufficient artistic, scientific, or other abilities. Some schizophrenics may make good soldiers partly because of their schizophrenia. If there is a maintenance of a good level of integration, the schizophrenic emotional blunting may be a protective mechanism so that there is less than normal anxiety to a stressful situation and a high level of toleration of combat danger and other stresses.

Some of the data suggest leads for improvement in selection of personnel prior to induction, more adequate recognition of the importance of some of the symptoms found, more adequate treatment of these individuals in the armed services and the need for the most effective rehabilitation when discharged from the services.

Our findings indicate that the capacity of the individual to function in civilian life is a more important criterion of how he will function in the service than is the presence of neurotic or psychotic symptoms. Accordingly, a socio-psychiatric evaluation, as recommended by Malamud and Malamud, would be helpful in eliminating many individuals who have shown evidences of illness and vulnerability to the type of stress occurring in the military service(6).

Those who have not been able to utilize their capabilities before induction are prone to have difficulty in adjusting to army life. There seems to be much truth in Marshal Foch's statement that the good citizen makes the good soldier. Many had shown psychopathologic symptomatology that had severely handicapped them in their school work and jobs. They continued to function poorly in the army and eventually had to be hospitalized. On the other hand, there was a large group that had functioned adequately in spite of certain symptoms both before and after entering military service. Many of these did well in the army prior to an acute mental breakdown. They frequently had held positions of responsibility and in some instances had been decorated or commended because of outstanding army service. In making assignments not only should aptitudes and

abilities be considered but also motivations, interests, and personality strengths and weaknesses. Some men can do a good job in any situation. However, many cannot function effectively in one situation but may in another. The better the psychodynamic orientation of the physician, the more efficaciously he may be able to treat or prevent psychiatric casualties. One patient may serve as an example.

As a child his main preoccupation had been trying to please his rejecting father and obtain some symbol of approbation that was never forthcoming. He met his feeling of rejection by attempting to excel but was never able to achieve a well-integrated adaptation to life. In the army his earnestness, punctiliousness, and hard work earned him the respect and approval that he had never been able to achieve at home. He was happier than he had ever been, effective and well-adjusted until an incident occurred during one of the invasion landings. He was one of the last 3 men to get off the landing craft. When one of the men stepped too far to one side and was sucked under the water by the propeller and disappeared, the other man, who was the patient's best friend, said to the patient that he was going to attempt a rescue. In spite of the patient's effort to dissuade him, he tried unsuccessfully to save the lost man but was not hurt himself. The patient, who had come so close to losing his best friend, became very preoccupied with this situation and reiterated his feeling that the rescue should not have been attempted. His reaction was interpreted by the men in his organization as a "yellow streak." In response to this disapproval he worked even harder in an attempt to please but his actions were interpreted as attempts to curry favor and so he was further scorned. Finally, in confusion one night he walked out into water over his head and abruptly turned around and came back. He could not understand his own behavior and shortly thereafter he developed an acute schizophrenic excitement. After recovery he recalled his walking out into the water as an attempt to prove that he was not yellow. His point of sensitivity was not the danger associated with the landing but his poor toleration of the fear of loss of his closest friend and the attitude of rejection of the other men. It is possible that had the battalion surgeon dealt with him in a sympathetic and understanding manner his acute schizophrenic attack might have been avoided.

Many patients gave evidences of an impending psychotic reaction. Had they been treated, evacuated, or perhaps reassigned before the severe psychotic symptoms developed they would have been less of a hindrance to those fighting a war. Many were sent back to duty from hospitals when it was evident that they could not be of value

to their organizations. From the standpoint of the morale of the others and discouraging widespread hospitalization, a certain amount of pressure on those who were not well adapted may be desirable, particularly when there is a manpower shortage as there was during most of the Pacific war. An effort has to be made to utilize every man to the fullest advantage and to discourage those who might tend to enlarge upon their symptoms and thereby escape from their tasks. However, differences in abilities and capacity for adaptation preclude complete justice and equality in assignment of duties. Those with the greatest capabilities must necessarily bear more of the burden of responsibility and sacrifice.

The man with hysterical or hypochondriacal symptoms, which were often precursors of an overt schizophrenic disorder, could no more carry on than the man with a wounded leg. However, he built up counterresentment in the men in his organization and often in the medical officers. The hostility engendered caused further hostility in the patient. An understanding but firm attitude might not do away with the symptoms in such an individual, but it might lessen antagonism and increase capacity to give some service.

To some extent there was conscious exaggeration of symptoms, especially in those with low morale and lack of will to serve. A factor influencing this type of reaction was that illness was the only possible escape from the isolated situation overseas. However, malingering in the sense of simulation of psychoses appeared to be rare. This is substantiated by the fact that a high percentage of these patients are still showing symptoms. In contrast to malingering, a number of those with schizophrenia were hyperconscious and continued to carry out their duties in spite of severe mental symptoms. After being hospitalized, they frequently requested to be returned to duty rather than evacuated to the United States.

The fact that a large number broke down after they had been overseas for some time may indicate that, whenever feasible, the army should attempt to return soldiers to the United States after some definite period, such as 18 months. Knowing that there is to be relief from the strain of an unusual

setting overseas after a specific length of time may serve as a goal and be a stimulus to tolerating hardship.

There has been more emphasis on evaluating the men for compensation than on rehabilitation. Most of them had been seen by the Veterans Administration only for determination of compensation status. At the time of discharge of these men from the army, when rehabilitation would have been most effective, the treatment program developed by the Veterans Administration in mental hygiene clinics was not yet in operation. However, after they were established there was a policy in some of these clinics to emphasize treatment of those with psychoneuroses. There is a lamentable tendency for psychiatrists to lose interest in patients who are not suitable for intensive psychotherapy and to be reluctant to treat schizophrenia. However, if a therapeutic effort is made, much can be done to help the schizophrenic reach a higher level of economic and social adjustment or sustain him in society and possibly prevent personality deterioration.

SUMMARY AND CONCLUSIONS

1. One hundred patients with schizophrenia or schizophrenic-like reactions occurring in a combat area have been investigated.

2. Follow-up data over a period of 5 to 8 years after the initial hospitalization were obtained through records, questionnaires, and personal interviews.

3. There was a high incidence of psychopathologic symptoms prior to the illness developing overseas.

4. The most common precipitating factors appeared to be traumatic incidents in combat, family problems, sexual conflicts, prolonged overseas service, difficulty in accepting responsibility, dissatisfaction with the army assignment, and problems in interpersonal relationships with others in the organization.

5. Eighty percent of the patients were evacuated to the United States within 2 months of the hospitalization.

6. On reaching the United States, one-fifth had shown marked symptomatic improvement. After two months of hospitalization, over a third of the patients had been

discharged. Only four were continuously hospitalized for more than a year.

7. Comparison of the prewar and postwar adjustment revealed that the general health, ability to function at work, family relationships, and social adaptation were all poorer, and the sexual adjustment was essentially unchanged.

8. There was a gradual trend toward decrease in disability, though personality deviations characteristic of schizophrenia persisted. After 5 or more years severely handicapping symptoms were present in one-fifth of the patients. Eleven had had further hospitalizations.

9. Although the amount of disability compensation had been gradually reduced, over three-fourths of the patients were still receiving some benefits.

10. The long-term course of the patients studied indicates that schizophrenia in the military service does not differ essentially from that occurring in civilian life.

11. Some schizophrenics functioned in the army for long periods prior to the acute episode despite psychopathologic symptoms.

12. Vulnerability in civilian life to the types of stress similar to those encountered in the armed forces indicates that such individuals should not be accepted for military duty.

13. A proper evaluation of the assets and deficiencies may lead to better military assignment and lessen the number of psychiatric hospitalizations.

14. A policy of returning soldiers to the United States after a definite period of service overseas may be of use in decreasing the number of psychiatric casualties.

15. The physician with an understanding of psychiatry may be of great help in preventing and treating psychiatric casualties. Since personality illnesses are a major problem in the military services, whenever it is feasible special courses or orientation periods in psychiatry should be offered for medical officers.

16. There has been too much emphasis on granting disability compensation and too little on rehabilitation. Continuous treatment efforts can help many with schizophrenia to reach or maintain their best level of adjustment.

17. This report has been based on a preliminary evaluation of the data and will be followed by a more definitive communication in which the findings among schizophrenics will be compared with carefully selected controls from the same military units.

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FOLLOW-UP STUDY OF PSYCHONEUROSES

PRELIMINARY REPORT¹

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INTRODUCTION

The study was begun in 1947 in order to learn more about the natural course of psychoneuroses that developed either before or during military service and required treatment in the service. We also hoped to learn more about the etiology of military neuroses, and in what proportion of the World War II total of approximately 600,000 men the neurosis first developed during service as contrasted with the preinduction period.

We were interested in learning what stresses contributed to the breakdown (*i.e.*, admission to medical care for a psychoneurosis with loss of at least one day of duty) of both types of cases and how significant a factor was predisposition. We wanted to know more about the military prognosis for effective service after treatment for a psychoneurosis.

We wanted also to find out how many men were still sick 5 years later, how many were in need of treatment, how many had already had treatment, how many were receiving disability compensation, and whether such compensation differed for those whose neurosis existed prior to service and for those whose neurosis resulted from the stress of service.

¹ Read at the 107th annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 7-11, 1951.

From the Department of Psychiatry, George Washington University, School of Medicine. Winfred Overholser, M. D., Professor of Psychiatry, was the responsible investigator. The study was supported by a contract with the Veterans Administration and constitutes part of the cooperative program of follow-up studies developed by the Committee on Veterans Medical Problems, National Research Council, and the Veterans Administration with the aid of the Army and Navy.

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PROCEDURE

Basic rosters, from which the sample was chosen, were furnished by the Surgeons General of the Army and Navy. Follow-up examinations were performed by some 225 selected psychiatrists all over the United States. When psychiatric examinations could not be performed, the American Red Cross generously lent the skills of its social workers and achieved considerable success both in persuading men to report for examination and in providing essential data not otherwise available. Follow-up work and statistical analysis have been performed by the staff of the Committee on Veterans Medical Problems of the National Research Council.

A representative sample of 955 cases was used. It consisted of 665 Army and 290 Navy and Marine Corps enlisted personnel treated for psychoneuroses during the war. The psychiatrists were asked to arrange for the examinations and were provided with pertinent military medical records and personnel data and with a history form specifying the information we desired. The latter included the details of family history, pre-service personality and adjustment, military experience and its relationship to the breakdown, treatment received in service, and, of course, all of the facts as to condition on follow-up.

Many difficulties were encountered in tracing the men, getting them to report for examinations, inducing the psychiatrists to send in their reports, etc. Within the framework of a voluntary approach to the subjects, we made every possible effort to maximize the number of examinations, and to obtain data from other sources if a psychiatric examination could not be arranged. The histories obtained from the subjects during military service conflicted at times with histories they give at follow-up, and a true picture often cannot be obtained in a 4-hour

examination, the maximum time allowed in this study. Some patients tend to minimize their difficulties and others to exaggerate them. Finally, there is the problem of achieving consistency in coding psychiatric data of this kind.

Despite the obvious difficulties and potential sources of error we do feel that there is sufficient validity in the over-all picture to warrant certain conclusions and to suggest the need for more intensive psychiatric study of cases than was possible in a broad survey of this type.

SOURCE OF FOLLOW-UP DATA

Some follow-up information was obtained on 98.5% of the cases. Sixty-two percent were examined by psychiatrists and information on the remainder came from VA hospital records, Red Cross social histories, VA claims folders, Red Cross letters, and questionnaires. In many instances there was information from 2 or 3 of these sources.

We compared those who were examined and those who were not to see if there were important differences between these 2 groups that might prevent their being considered as one or that might suggest that the follow-up status of those whose present condition is known differs very materially from those whose condition is not known. Analysis showed them to be remarkably comparable in most areas. There were some statistically significant differences but we felt that they were of minor importance.

RESULTS

MILITARY STATUS

Table 1 shows the military status of the men in the sample, and illustrates the similarity in the distributions of the examined and not examined groups.

GEOGRAPHIC DISTRIBUTION

Table 2 gives the geographic distribution of the cases at follow-up and its comparison with the distribution of the white male population in 1940. Although we started with a representative, nation-wide sample, we found it necessary to reduce the rural area representation to one-half.

PRESERVICE PERSONALITY

All available information was used to classify each individual as to preservice personality with the following result:

14.2% were well integrated
34.0% had neurotic traits
16.3% had suggestive neuroses
14.6% had overt neuroses
20.1% had pathological personalities
0.3% had latent or overt psychoses
0.5% had organic posttraumatic syndromes

TABLE 1

PERCENTAGE DISTRIBUTION OF SAMPLE BY MILITARY STATUS IN WORLD WAR II, EXAMINED AND NOT EXAMINED CASES

Status	Percentage distribution	
	Examined	Not examined
Army		
Regular	10.5	12.1
National Guard	1.4	3.0
Inductee	57.5	54.9
Navy and Marine Corps.	30.6	30.0
Total	100.0	100.0
Number of men	592	363

TABLE 2

PERCENTAGE DISTRIBUTION OF SAMPLE BY REGION OF RESIDENCE AT FOLLOW-UP, AND OF U. S. WHITE MALES, 1940

Census region of residence	Percentage distribution	
	Sample	U. S. white males, 1940
New England	9.2	6.0
Middle Atlantic	31.2	22.0
South Atlantic	12.9	22.0
East North Central	20.2	11.1
East South Central	4.5	11.0
West North Central	5.7	6.8
West South Central	4.4	9.0
Mountain, Pacific	11.0	11.5
Outside U. S.	0.9	...
Total	100.0	100.0

Those who were classified as having neurotic traits manifested minimal evidence of emotional difficulty and ordinarily would be considered normal. When this group is added to the well-integrated group, it is seen that 48% of those who were treated for psychoneurotic disorders in the service had no appreciable emotional difficulty prior to entrance into the service. Roughly one of 7 was overtly neurotic and one of 5 had a manifest

personality disorder that in some instances was associated with behavioral difficulties of a severe degree. The posttraumatic syndromes were organic in nature, the result of old head injuries.

An estimate was also made of the degree of impairment in over-all functioning of psychiatric origin that was present prior to service. There was no impairment in 51%, and 88% had no more than mild impairment. Eleven percent were moderately impaired and 1.3% markedly impaired. It is apparent, when these figures are compared with those for preservice personality, that an overt neurosis or pathological personality was not always associated with much impairment.

The men were asked how their health was when they entered service and 6.4% stated that it was definitely impaired or very poor. Approximately 70% described their health as excellent and 24% as fair. Again, it is apparent that the presence of a significant emotional difficulty was not necessarily reflected in a man's estimate of his health, which in general is apt to be thought of in terms of physical disease.

STRESS

In many instances there were multiple stress factors precipitating breakdown in service, but an attempt was made to determine the major area of stress in each case. For 12% no single area was primary. In 42% of all cases (or 48% of cases with a primary area), it was combat. In 6.4% it did not seem to be related to military service *per se* but rather to such things as economic hardship and domestic difficulty. In 7.6% the primary stress was connected with just the fact of being in the Army or Navy and objectively was no more than most men had to contend with. It involved such things as fear of impending shipment overseas, homesickness, change in diet, anxiety about entering the service, and lack of comfort. In 12% military frustrations were primary. These included such things as regimentation, misassignment, poor leadership, lack of promotion, feeling of uselessness, or too much responsibility. In 14% climate, excessive physical demands, injury

or illness, and prolonged service overseas provided the primary stress. In 4.6% no stress was evident and these should probably be grouped together with those whose stress was of civilian or of inherent military type. In many instances a suggestive relationship between the stress and specific personality characteristics could be seen. The relationship between preservice personality and the nature of the stress associated with the breakdown will be discussed later.

SITE OF BREAKDOWN

Thirty-five percent broke down in this country before ever having gone overseas. (It will be shown later that this group did not just consist of those who had pre-existing neuroses or personality disorders.) Fifty-two percent broke down overseas and 13% after returning to this country from overseas. Two-thirds of this latter group had been in combat while overseas. It is possible that some of these men were hospitalized after receiving medical check-ups at the redistribution centers, which were established for processing men who had returned from overseas assignments; but others may have decompensated when they lost the sustaining force of their buddies and units by being assigned to a new organization, which often was resented.

VALIDITY OF SERVICE DIAGNOSIS

Many have expressed doubt about the validity of some of the diagnoses of psychoneurosis made in the armed forces during World War II. Consequently each examiner was asked, on the basis of his review of the entire case, to indicate his concurrence or nonconcurrence with the diagnosis made in service. Excellent agreement was seen; concurrence was expressed in 88% of the 592 examined cases. In 4.8% the condition was, in retrospect, thought not to be psychiatric, and in 5.2% it was considered psychiatric but improperly classified as a neurosis. Most of the latter were regarded by the examiners as personality disorders, which does not exclude the possibility of episodic neurotic reactions. In 2% of the cases the examiners were undecided.

PATTERN OF DISPOSITION FROM MILITARY HOSPITALS

Thirty-nine percent were discharged for psychiatric disability without ever having been returned to duty. An additional 18% were returned to duty at least once but later discharged on psychiatric grounds, making a total of 57% thus discharged. An additional 3% were given administrative discharges but on psychiatric grounds. Forty percent were returned to duty and never discharged on psychiatric grounds.

VETERAN'S EVALUATION OF HIS HEALTH AT SEPARATION

The examiner asked each man to compare his health on separation from service with the way he felt at entry, with the result that 16% said their health was the same; 36%, somewhat worse; 45%, much worse; and 3%, better. It is seen that 81% experienced some deterioration in their health during their period of military service. The few who stated that their health was better spoke of such things as increased maturity and better ability to get along with people.

EXAMINER'S EVALUATION OF PATIENT'S HEALTH AT SEPARATION

At follow-up the psychiatric examiner made a judgment as to the patient's emotional health at separation from service. These judgments were reported as follows: 15% were normal or had neurotic symptoms short of an actual neurosis; 55% had neuroses that were not severe; 20% had severe neuroses; 6% had personalities associated with behavior disorders; and 4% had organic syndromes. What proportion of the 15% who were essentially normal were combat cases has not yet been determined. It is of interest that 70% were either normal or had neuroses that were not severe.

SYMPOMS REPORTED AT FOLLOW-UP

Examiners were asked to list symptoms volunteered spontaneously by the subjects in describing their health. Only 10% reported none. The frequency of the more common complaints is shown in Table 3.

PSYCHIATRIC DISABILITY AT FOLLOW-UP

Taking as the norm the patient's evident capacity, examiners rated the disability as follows: 44.9% essentially no disability; 26.6% no more than slight disability; 20.4% moderate disability; 7.5% severe disability but not in hospitals; and 0.6% totally disabled but not necessarily in a hospital. Nearly three-fourths (72%) had no disability or no more than slight disability at follow-up and only 8.3% were severely or totally disabled.

TABLE 3
PERCENTAGE OF SAMPLE REPORTING SPECIFIC MAJOR SYMPTOMS AT FOLLOW-UP

Specific symptoms	Percentage reporting
None at all.....	10.1
Irritability.....	49.4
Anxiety.....	45.2
GI, functional.....	41.2
Restlessness.....	41.0
Headache.....	40.5
Musculo-skeletal, functional.....	36.0
Insomnia.....	39.3
Depression.....	27.6
Nightmares.....	20.9

EMPLOYMENT STATUS AT FOLLOW-UP

Eighty-five percent of the men were employed (76% full-time and 9% part-time). Of the 15% who were unemployed, in only half was it because of illness. Of the 9% who were employed only part-time, in two-thirds of the cases it was because of illness. In all, the employment status of 14% was affected by illness.

CHANGE IN PSYCHIATRIC CONDITION SINCE SEPARATION

Fifty-four percent have shown improvement since separation and 13% have become worse. Thirty percent describe no change and 3% are unknown.

PSYCHIATRIC DIAGNOSIS AT FOLLOW-UP

Diagnosis was considered apart from disability since the presence of a mild psychoneurotic disorder was not necessarily associated with any significant disability (Table 4). Since 72% had no disability or at most slight disability, and only 28% had

no diagnosis, it can be seen that even the more pronounced degrees of illness were not always associated with significant disability. This is also reflected in the employment figures. In only 14% was the employment status affected by illness.

PSYCHIATRIC TREATMENT SINCE SEPARATION

Treatment was roughly classified as to type and, in part, as to intensity, with the following result: 65% had no treatment; 21%

TABLE 4
PERCENTAGE DISTRIBUTION OF SAMPLE BY
PSYCHIATRIC DIAGNOSIS AT
FOLLOW-UP

Psychiatric diagnosis	Percentage
Not psychiatrically ill.....	26.8
Uncertain if psychiatrically ill.....	1.5
Psychoneurosis, mild.....	32.8
Psychoneurosis, moderate.....	19.2
Psychoneurosis, severe.....	5.6
Personality or behavior disorder.....	11.4
Psychotic reaction.....	1.7
Other.....	1.0
Total	100.0

had symptomatic treatment by a nonpsychiatrist; 11% had brief psychotherapy; and 2% had intensive or prolonged psychotherapy. The remaining 1% were treated by drugs, electroshock, etc. Treatment (used in the broadest sense and often meaning being seen briefly by a doctor) had been provided to 5.0% in VA hospitals, and to an additional 6.1% in VA clinics or contract clinics, or 11% in all. Otherwise stated, one-third of those reporting any treatment had been to a VA clinic for treatment.

VETERAN'S ATTITUDE ON NEED FOR TREATMENT

The men had the following opinions as to their need for psychiatric treatment: 16% expressed great need for treatment, 24% expressed some need, 56% expressed no need, and 4% had no opinion. These figures are in remarkable agreement with the examiners' estimates of the need for treatment. They felt that 56% of the men either

did not require treatment or would continue to adjust without treatment. They described 17% as in great need of treatment and thought that an additional 23% would benefit considerably from treatment. It was felt that 4%, although ill, would not benefit from treatment.

COMPENSATION FOR DISABILITY

Since in only 5% of those receiving compensation was it for a nonpsychiatric disorder, the following distribution represents essentially compensation for psychiatric disability: 53% received none; 22% received less than \$20 per month; 18% were receiving between \$20 and \$60 per month; and 5% were receiving \$60 or more per month. Of the men drawing compensation, the examiners felt that compensation had an ill effect on 19%, a helpful effect on 18%, and no effect on 63%. Of the men not drawing compensation, the comparable percentages are 6, 12, and 82, respectively. This is in sharp contrast to experience with workmen's compensation cases and it may be because of the relatively small payments that the veterans are receiving.

PROGNOSIS WITHOUT TREATMENT

In 32% the prognosis was good to excellent; in 50.6% it was guarded; in 17.2% poor; and in 0.2% (2 cases) hopeless. The examiners felt that the prognosis of 31% would be considerably improved by treatment.

PSYCHIATRIC DISABILITY

The questions inevitably arose, "Who are the men who show the most disability at follow-up? Are they the ones who did or did not have treatment? Are they the ones who most felt the need for treatment? What is the relationship between the severity of disability and amount of compensation? Is disability related to the type of stress that precipitated the breakdown in service? Is it related to treatment received in the service, or to the preservice personality?" The fol-

lowing relationships were explored in order to find the answers to such questions:

1. Relation to Predisposition

Predisposition is here analyzed in terms of the following preservice characteristics: personality, adjustment, symptoms, psychopathology in parents, and withdrawal of parents by death, chronic illness, and divorce.

Preservice personality is intimately related to disability at follow-up. At follow-up 92% of those who were well integrated prior to service exhibited symptoms that seemed at most only slightly disabling, and 8% were at least moderately disabled. Corresponding figures for those with overt neuroses before service are 61% and 39%, and for those with pathological personalities before service they are 49% and 51%.

Similarly, *preservice adjustment* in various areas of activity (school, family, sexual, occupational, and community) bears a strong relationship to condition on follow-up. In comparison with those who were well adjusted before service, 3 to 4 times as many with impaired adjustment prior to service are now at least moderately disabled.

Two-thirds of those who are severely or totally disabled are suffering from *symptoms that they had prior to service*, and three-fifths of them have new symptoms as well. In only one-third of the severely and wholly disabled do the present symptoms seem to have had their onset in military service. About one-half of the slightly disabled group have symptoms that they had prior to service and about one-half have symptoms that started in service.

Disability at follow-up is also positively correlated with *psychopathology in parents*. Of those who had at least one parent with a clear-cut psychosis or neurosis and whose other parent had at least suggestive evidence of an emotional or personality disorder, 61% were at least moderately disabled at follow-up. Among men both of whose parents had negative psychiatric histories, only 19% were at least moderately disabled at follow-up.

An extremely interesting finding was that, in contrast to the parental psychiatric his-

tory, parental withdrawal through death, divorce, chronic illness, etc., prior to age 16 is entirely uncorrelated with degree of disability at follow-up. We plan to recode this material on the basis of more refined age groups in order to explore the relationship further.

2. Relation to Combat Stress

Combat cases as a whole exhibit on follow-up about the same disability as the non-combat cases (44% versus 46% have no disability). This seemed at first a surprising fact, since 67% of the combat cases were well integrated or had no more than neurotic traits before service, in contrast to 30% of the noncombat cases. However, it was found that a larger proportion of combat than of noncombat cases reported deterioration in their health between entry into service and follow-up (78% versus 64%) and that, between separation from service and follow-up, combat and noncombat cases showed the same incidence of improvement and deterioration. It may be concluded, therefore, that *during the period of service* the combat cases deteriorated more than the noncombat cases.

The fact that the combat cases as a whole show approximately the same disability at follow-up as the noncombat cases would seem to be inconsistent with the finding that preservice personality is significantly related to disability at follow-up, since the combat cases were healthier as a group before service. This will require further analysis of each preservice personality group.

Those who broke down in naval combat exhibit more disability now than those who broke down in ground combat. Of those who had sea combat 43% are at least moderately disabled in contrast to 27% of those with ground combat. This suggests more stringent evacuation criteria on the part of Navy combat vessels or inability to evacuate men with breakdowns as easily as in the Army. Severity and duration of combat, on the other hand, are not significantly related to disability at follow-up for the combat cases. We do not yet know why this is so.

3. Relation to Treatment and Severity of Illness in Service

The type of treatment received in the service was found to be unrelated to disability at follow-up, but how a man responded to treatment in the service is an important indicator of his future condition. A man who did not respond to treatment is 3 times as likely to be at least moderately disabled at follow-up as one who responded very favorably.

Disability is also strongly related to the severity of illness in the service. Of those whose illness was severe, 39% are now at least moderately disabled, in comparison with 20% for those whose illness was mild.

4. Relation to Type of Disposition from Hospital

Of those who were discharged from the service for disability 36% were at least moderately disabled at follow-up in contrast to 18% of those who were returned to duty and never discharged for disability. In part this difference may well derive from the fact that those who were discharged for disability were sicker. However, a comparison of disposition groups matched on other factors of prognostic significance (preservice personality and impairment, major area of stress, and severity of illness in service) suggests that the disability discharge in itself may be a factor. It is possible that a man who is discharged as disabled may have to contend with the psychological factor of being considered sick, including the temptation of secondary gains, and therefore not do as well as a similar man who is returned to duty and later separated administratively on points.

5. Relation to Emotional Health at Separation

Disability is also strongly related to health on separation from the service. Of those who were not ill at separation, 91% are well now and none even moderately disabled. Of those who had severe neuroses at separation, 21% are well and 51% are at least moderately disabled.

6. Relation to Change in Condition since Separation from Service

Present disability is to a considerable degree related to change in condition since separation from the service. Unfortunately at this time we do not know what role treatment may have played. Great changes occurred, however, both in the direction of improved health and greater illness. For example, 60% of those who are severely or totally disabled have gotten worse since separation from the service, and 69% of those with no disability report improvement since separation.

Ninety-six percent of those who are at least moderately disabled were ill at separation, and about 75% of this group are the same or worse than at separation. Conversely, only 5% of those not ill at separation are at least moderately disabled now.

There seems to be no significant relationship, however, between course of illness after separation and preservice personality. Within the limits of sampling error, an equal proportion of all preservice personality groups have remained the same, have improved, or have become worse.

All of those who are severely or totally disabled maintain that their health is worse or much worse than it was before they entered the service. Whereas the majority (74%) of these men had some neurotic or personality difficulty prior to service, they seem clearly to have gotten worse since entering service and even since separation from service. About 70% of all the cases studied report that their health is worse at present than at entry into service. The great majority of those who report it as unchanged or better have no disability.

7. Relation to Treatment since Separation

The chance of receiving treatment was studied in relationship to disability. (This was not an evaluation of the effect of treatment.) It was found that those who had some disability received treatment more than twice as frequently as those without any disability, but that among those with disability the proportion receiving treatment bore no significant relationship to the severity of

disability. Fifty-five percent of those with severe or total disability received some treatment since separation from the service and only 35% of this same disability group expressed great need for treatment. It was of interest that 3% of those with no disability (but not without symptoms) expressed great need for treatment.

The psychiatrists' opinions on the need for treatment show a much higher correlation with the degree of disability. They felt that only 1% of those with no disability, 12% of those with slight disability, and 66% of those with severe or total disability were in great need of treatment.

8. Relation to VA Disability Compensation

While a definite relationship was found between the amount of compensation and the examiners' estimate of disability, no complete correlation could be expected inasmuch as the factors of service connection and service aggravation enter into the determination of entitlement to compensation. Thirty-seven percent of those with no disability were receiving compensation but only 12% of this group were receiving \$30 or more a month. In contrast, 75% of those with severe or total disability were receiving compensation and 48% of this group were receiving \$30 or more a month.

9. Relation to Adjustment at Follow-Up

Adjustment in every area (economic, marital, family, sexual, community, etc.) is strongly related to disability. The relationship is especially close in the occupational area, where 92% of the severely disabled are maladjusted and 92% of those with no disability are satisfactorily adjusted.

10. Relation to Prognosis

As would be expected, there was a very strong relationship between disability and prognosis; the more disabled a man was, the less favorable his prognosis.

SUMMARY

1. Although approximately 50% of a representative sample of enlisted men with psychoneurotic disorders during World War II

had significant and clinically recognizable psychiatric difficulty prior to entering the service, the remainder were sufficiently well adjusted that they could not have been rejected for induction under any conceivable screening examination. Even the group with overt neuroses prior to entering the service was by no means a total loss; in 18% breakdown did not occur except under the stress of combat; 32% served overseas; 30% were demobilized without requiring a medical discharge.

2. Combat was by far the most frequent stress that resulted in breakdown.

3. At the time of separation from service 70% either were not ill or had neuroses that were not severe. Disability discharge was not necessarily associated with marked disability at follow-up. On the basis of the degree of disability in civilian life associated with varying degrees of severity of psychoneurotic disorders it is estimated that about 60% of those who received disability discharges were capable of working full-time in some capacity at the time of separation.

4. At follow-up 45% had essentially no disability and an additional 27% had symptoms that were not more than slightly disabling. Only 8% were severely or totally disabled.

5. Sixty-five percent have had no treatment since separation and an additional 21% have received only symptomatic treatment by nonpsychiatrists. There remains a considerable need for psychiatric treatment.

6. Forty-seven percent were receiving disability compensation, half of them less than \$20 per month. In only 19% of the cases receiving compensation did the examiner feel that compensation had an ill effect. It was found that 37% of those who seemed to have no disability were receiving compensation.

7. The psychoneurotic disorder is not static. The condition of more than half of the men has improved since separation. Most of those who were not disabled at follow-up had improved since separation from the service, but most of those who were severely disabled at follow-up had become worse since separation. (This seems to bear no strong relationship to preservice personality.)

8. The majority of those who were severely or totally disabled at follow-up had had some psychiatric difficulty prior to service. Also, 70% of the men reported their health at follow-up as worse than on entry into the service, and 30% reported it as unchanged or better.

9. Severity and duration of combat are not related to degree of disability at follow-up.

10. There is a suggestion that discharge for disability in itself may contribute to the perpetuation or aggravation of a psychoneurotic disorder.

11. Symptoms that were no more than slightly disabling were observed at follow-up in 92% of those who had been well integrated prior to service, in 61% of those who had overt neuroses, and in 49% of those with pathological personalities prior to service. Conversely, 8% of the normal group, 39% of the overtly neurotic group, and 51% of the pathological personality group were classified as moderately to totally disabled.

12. The degree of disability on follow-up is related to the extent of psychopathology in the parents.

THE CENTRAL MECHANISM OF THE EMOTIONS (EXPERIENCES WITH CIRCUMSCRIBED THALAMIC LESIONS)¹

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An attempt to correlate with definite anatomical structures the central mechanism upon which emotions depend may start with 2 facts pointing to the importance of the diencephalon. Following elimination of the part of the central nervous system cranial to the midbrain only rudimentary affective reactions (pseudoaffective reflexes of Woodworth and Sherrington(23); Keller(11)) are demonstrable, if any, while following decortication emotional reactions are not only preserved but may even be exaggerated, as evidenced by the appearance of rage-like reactions (Goltz(8) in dogs), particularly following the destruction of phylogenetically old parts of the cortex (Spiegel, Miller, and Oppenheimer(21); Bard and Mountcastle(2) in cats). In other words the central mechanisms related to emotional responses must be searched for in the subcortex, cranial to the midbrain.

The thalamic theory of emotions is chiefly based on Head's observations(10) of hyper- and dysaesthesia in thalamic lesions and has been most clearly formulated by Cannon (3, 4). According to that author, afferent impulses on their way to the cortex excite a center in the thalamus. This center discharges on the one hand toward the periphery, thus innervating the expression of emotions, and on the other hand to the cortex where the thalamic impulses add the peculiar quality of emotion to the simple sensation aroused by the direct effect of the exciting stimulus. The evidence adduced in support of the thalamic theory has been severely criticized by Lashley(12). While agreeing that the thalamus contains centers in which at least some of the patterns of ex-

pressive movements are integrated he points out that the symptoms of hyper- and dysaesthesia reported by Head in thalamic lesions are not confined to lesions involving the thalamus and its cortical connections. They cannot be interpreted as general changes in affectivity, are restricted to a small group of somesthetic sensations, and may be related to phenomena of pathologic summation and irradiation. In reviewing Lashley's critique it should not be overlooked that he does not prove in any way that the thalamus is not concerned with the mechanism of emotions, and that he brings no argument in favor of another localization. Lashley offers only a critique of the evidence upon which Head's and Cannon's theories are based and of the conclusions drawn from their data, but he fails to offer new data that may help us to understand the central mechanism of emotions. Recently Rapaport(20) also doubts that such a complex function as emotion depends on a single center.

Admitting that the data collected by Head and Cannon are not sufficient for localization of the mechanisms underlying emotions in a definite structure one is forced to search for additional, more relevant material. It seems tempting to scrutinize in this respect the experiences accumulated by psychosurgery particularly since the main therapeutic effects of the various psychosurgical procedures are relief of tension, anxiety, and other emotional disturbances. Some authors, particularly Freeman and Watts(6), are inclined to explain these therapeutic effects of the various frontal lobotomies and leucotomies by the severance of thalamo-cortical connections, particularly those between the dorsomedial nucleus and the frontal association areas. Although such an interpretation is very attractive, it cannot be overlooked that the operations on the frontal lobe whether in its white matter or in its cortical areas produce reactive changes not only in

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the thalamus but in other subcortical structures as well as in other cortical areas that are connected with the frontal lobe by association systems. Studies by Yakovlev *et al.* (24) have particularly demonstrated the extensiveness of the degenerations following frontal lobotomy. Less equivocal information regarding the role of the thalamus in the mechanism of emotions perhaps may be obtained by an analysis of the experiences with thalamotomies, since these operations produce sharply localized lesions in the thalamic nuclei with minimal damage to overlying structures, thus creating conditions that may be comparable, in regard to exactness of localization, with results observed so far in laboratory studies only.

operated cases the patients are no longer so upset by emotionally charged situations as they were before operation.

Studies using Garrison's anxiety and complaint inventory (7) show a similar trend; they are summarized in Table 1.

A statistical analysis of these changes by applying the *t* test for the significance of differences between means reveals that the decline in mental complaints is significant at the .01 level. Also possibly significant at the .1 level are the decreases of full-scale anxiety scores and the 3 complaint inventories grouped together. The questions dealing with self-consciousness also appear to approach significance; *P* is at the .1 level. Further studies of this type are in progress.

TABLE 1

	N	Preoperative		Postoperative		Diff.	% of Pre- op. Mean	<i>t</i>	<i>P</i> *
		Mean	Sigma	Mean	Sigma				
ANXIETY (FULL INVENTORY).....									
Self-referred anxiety	10	60.9	37.6	47.0	34.1	-13.9	-23	1.9	0.1
Externalized anxiety	10	22.6	14.9	16.5	12.8	-6.1	-27	1.6	0.2
Mixed anxiety	10	8.5	5.8	6.4	6.5	-2.1	-25	0.9	0.4
SELF-CONSCIOUSNESS	10	24.4	10.2	19.9	13.5	-4.5	-18	1.5	0.2
SELF-CONSCIOUSNESS	10	30.5	20.6	22.8	18.2	-7.7	-25	1.8	0.1
COMPLAINTS GROUPED TOGETHER.....									
Physical complaints	10	17.2	7.5	13.2	5.7	-3.7	-21	2.1	0.1
Mental complaints	10	16.2	6.4	13.1	4.8	-3.1	-19	1.6	0.2
Mixed complaints	10	20.7	8.8	14.4	6.0	-5.3	-26	3.5	0.01

* *P* (probability) .01 is significant, .1 is probably significant, the other values greater than .1 are not significant.

This may be illustrated by 2 specimens, the first one from a schizophrenic patient who died several weeks after return from our institution to the state hospital apparently because of an overdose of scopolamine and the second a schizophrenic patient who died 2 years after thalamotomy from a carcinoma of the colon. Figs. 1 and 2 show that sharply localized lesions had been produced in the dorsomedial nuclei.

Our material consists of 58 cases in which lesions of various thalamic nuclei and combinations of such lesions were produced. The majority of these were bilateral lesions of the dorsomedial nuclei. Following this procedure, in about two-thirds of the cases relief could be obtained from tension and anxiety states, obsessive thinking, agitation, aggressiveness, and compulsive behavior. The emotional reaction to hallucinations and delusions may be reduced, and these symptoms may eventually disappear. Rorschach studies also seem to indicate that in successfully

since the inventory needs to be applied to a larger group.

For our problem the failures of psychosurgery are perhaps more instructive than the successful operations, particularly those cases in which relapses were observed and emotional disturbances reappeared. These relapses have occurred following the various forms of psychosurgery not only prefrontal lobotomy, transorbital lobotomy, topectomy, and thalamotomy, but even after complete frontal lobectomy (18) or practically complete isolation of the prefrontal cortex (14). The appearance of these relapses indicates that a single circuit such as the one connecting the dorsomedial nuclei with the frontal pole cannot represent the only anatomical basis for the mechanism of emotions and that other systems must exist that may compensate for its loss. We observed relapses in 26.6% of the improved cases observed up to 4 years. For comparison it may be mentioned that in 12 of 20 cases ob-

served by Freeman and Watts over a 10-year period the relief following the first operation was only transitory. When confronted with such relapses the question arises which thalamic nuclei in addition to the dorsomedial nucleus may play a part in the mechanism of emotions. We studied particularly the effect of lesions in 2 additional regions, namely in the anterior nucleus and the hypothalamus.

A possible relationship of the hypo- and subthalamus to emotions is less clearly demonstrated by stimulation experiments than by elimination of parts of this region. In the experiments of Masserman on cats(13), electric stimulation of the hypothalamus produced vivid expressions of rage apparently without a subjective experience of emotions. Following subthalamic lesions in cats, Miller and Spiegel(15) observed a transient somnolence and catalepsy, and noted that the animals were less excitable than before operation. In Ranson's experiments(19) on monkeys bilateral lesions of the lateral hypothalamic areas caused a decrease of the emotional reactions; excitement was replaced by drowsiness and somnolence and the animals became tame and unafraid.

Participation of the anterior nucleus-cingular gyrus system in the mechanism of emotions has been suspected by Papez(17); favorable experiences of Ward and Solomon, Greenblatt *et al.*(9) in psychotic patients with bilateral undercutting of the gyrus cinguli and our own animal experiments with stimulation and lesion of the anterior nuclei point in a similar direction.

We produced lesions in the lateral part of the posterior hypothalamus and/or in the anterior nuclei in patients who had reacted beneficially to lesions of the dorsomedial nuclei but in whom these improvements had been transient. Both types of additional lesions proved efficient in reducing the patient's emotional disturbances. This may be illustrated by the following case.

An unmarried white male schizophrenic had a brief nervous breakdown at the age of 15, but he was not so acutely disturbed as to require hospitalization. When he was 17 he had to be admitted to the hospital on account of his extreme excitement. He had both auditory and visual hallucinations. After a short course of electroshock treatment, patient became less confused, much quieter, and com-

pletely cooperative. One month later he had to be readmitted; he was extremely agitated requiring restraint. He constantly mumbled names of fighters and band leaders incoherently. He seemed to be suffering with visual hallucinations. He was alternately laughing and crying and unable to sleep.

Bilateral lesions were placed in both dorsomedial nuclei on 7-7-47. Following his discharge patient showed gradual progressive improvement. At first he complained of headache whenever he was in a noisy environment; this occurred particularly when his little brother engaged in play. At times at night he would see things on the walls, which he realized must be imaginary. Gradually his affective responses became more nearly normal. He no longer complained of headaches precipitated by noises and was no longer irritable. His weight was increasing.

In January 1949, 1½ years after thalamotomy, the patient relapsed, hallucinated, and had to be readmitted in view of his excitement. Since a second thalamotomy increasing the lesion of the dorsomedial nuclei failed to change his condition, it was decided to place a small lesion on either side in the lateral hypothalamus in a 2-stage operation. Following this procedure, he quieted down, no longer hallucinated, and became easily manageable. Although he still showed schizophrenic traits, laughed inappropriately, he could be discharged from the hospital and his parents were able to readjust him on a farm.

In November 1950 the patient again became disturbed with frequent episodes of crying. No hallucinations or delusions could be elicited. The patient was given 8 electroshock treatments but suddenly he became acutely disturbed, threatened to kill a patient in the bed next to him, and expressed some systematized paranoid delusions.

On 12-7-50 bilateral lesions were placed in the anterior nuclei of the thalamus. Four days later the patient was euphoric and anxious to get a job. He was discharged on 12-19-50. At this time he seemed very friendly, possibly more in contact with reality than he had been for months. He was somewhat spontaneous now. No delusions or hallucinations could be elicited. Reexamination 5 months later showed that the improvement is sustained.

The question arises whether the effect of such thalamic lesions is due to their specific localization or whether the operative procedure *per se* may be able to produce the changes in the patient's behavior. In this regard the following observation is of interest.

This was an unmarried white female, 40 years old, who had developed ideas of persecution involving both her brothers and the neighbors over the past 4 years; she became depressed, overreligious, and developed auditory hallucinations. In the first operation the lesion was inadvertently produced in the posterior part of the thalamus in the vicinity of the corpora quadrigemina owing to a displacement of the base of the stereotaxic frame. The location of the lesion was indicated by a droplet of

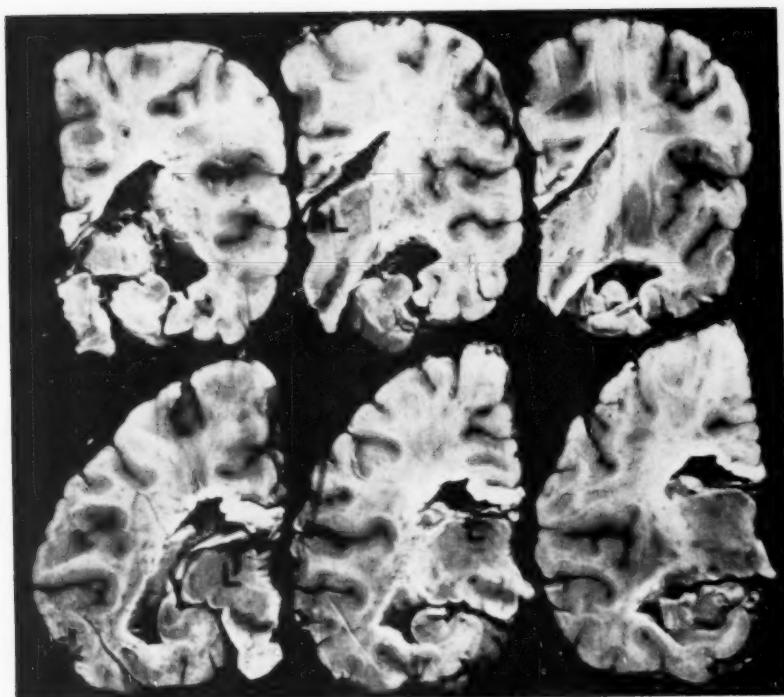


FIG. 1.—Schizophrenic patient. Lesion of the dorsomedial nuclei (L).

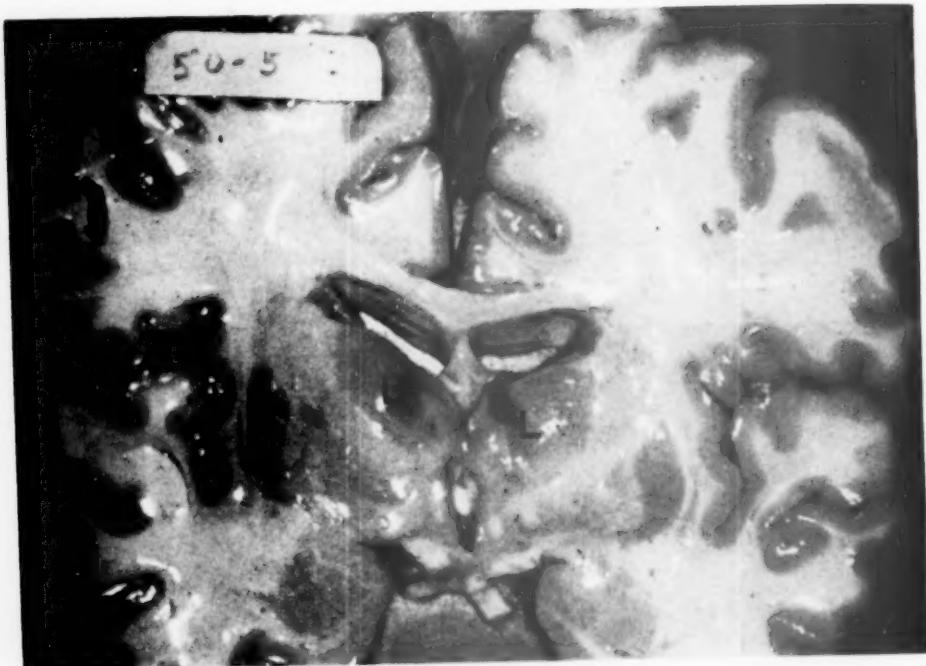


FIG. 2A.



FIG. 2B.

FIG. 2A and 2B.—Schizophrenic patient. Lesion of the dorsomedial nuclei (L). Note intactness of the cerebral hemispheres. (Photograph courtesy of Dr. H. Riggs)

pantopaque injected at the end of the operation as well as by impairment of the upward movement of the eyeballs and loss of the light reflex of the pupils. This lesion failed to influence the psychotic picture of the patient, her suspicious and paranoid attitude.

Several weeks later a second operation placed the lesion correctly in the region of the dorsomedial nuclei. About one month after this operation the symptoms of depression, paranoid delusions, and religious preoccupation were no longer present. Her spirits were good and one could consider her in a state of complete remission, which has persisted up to the present time (2 years after operation).

Thus it seems that the lesions must be placed in specific parts of the thalamus in order to relieve the patient's emotional disturbances.

We infer from our observations that the central mechanism of emotions is not limited to a single nucleus of the diencephalon but that various diencephalic nuclei participate in this mechanism. In analyzing the systems involved one has first to consider thalamo-cortical circuits, in view of the effect of the various frontal lobe operations, particularly thalamo-frontal systems such as the connections of the dorsomedial nuclei with the frontal association areas, of the anterior nuclei with the cingulate gyrus, and the frontal connections of the hypothalamus by way of nuclei of the septum pellucidum (22) or of the zona incerta (5). (See Fig. 3.)

It should be emphasized that the circuits between the diencephalon and the frontal lobe are not sufficient to explain all clinical observations. It has been mentioned that relapses may occur even after total frontal lobectomies (18) or practically complete isolation of the prefrontal cortex, and we had occasion to observe patients in whom frontal lobotomy performed by others had produced only transitory improvement or none at all, whereas the subsequent thalamotomy was able to induce a definite diminution of the abnormal emotional reactions, as shown by the following case.

The chief complaints of this 39-year-old married, white barber were pains in the stomach and the chest, which went up to the back of his neck with a feeling of tightness there, and fears of using knives, scissors, or shears. He was afraid to do harm to himself or to other people. If his youngsters made even the slightest noise, he got so irritated that he was afraid that he would do something. Since becoming ill he has had many disturbing dreams with animals such as elephants

and snakes chasing him and dreams of falling. The patient expressed a strong fear of strokes particularly since both his mother and father had one. A diagnosis of severe anxiety neurosis was made.

The patient had received various forms of treatment including frontal lobotomies over a 5-year period. These lobotomies were described by the neurosurgeon as "as radical as any that have been

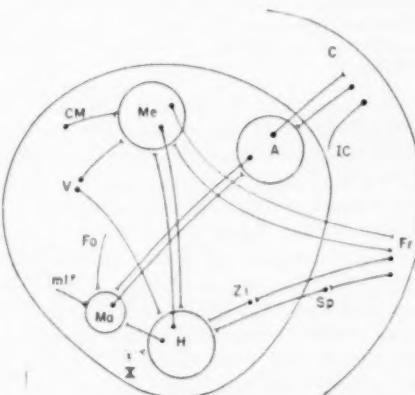


FIG. 3.—Circuits participating in the mechanism of emotions.

- Between medial nuclei (*Me*) and frontal lobe (*Fr*).
- Between anterior nuclei (*A*) and cingulate gyrus (*C*).
- Between hypothalamus (*H*) and frontal lobe (*Fr*).
- Centrifugal path from *Fr* to *H* is interrupted in the septum pellucidum (*Sp*) and the zona incerta (*Zi*).
- Intradiencephalic circuits between medial nuclei (*Me*) and hypothalamus (*H*) and between anterior nuclei (*A*) and mammillary body (*Ma*).

Afferent impulses: to the medial nuclei from centrum medianum (*CM*) and from the ventral thalamic nuclei (*V*); to the hypothalamus (*H*) from the vagus (*X*, only physiologically demonstrated), and from the ventral thalamic nuclei (*V*); to the mammillary body (*Ma*), from the fornix (*Fo*), the hypothalamus (*H*), and, according to Papez, perhaps from the medial lemniscus (*ml*) by way of the mammillary peduncle.

devised," and were performed by a superior approach in a plane that "nearly always passes into the tip of the lateral ventricle." Following the first lobotomy the patient was improved for about 3 months. Following the second, somewhat more extensive lobotomy, the improvement was still shorter and the patient became rather depressed.

Thalamotomy was performed on 2-24-49 (electrolytic lesions in both dorsomedial nuclei). Within 2 hours after the operation he stated that he was

no longer bothered by the peculiar thoughts that once disturbed him and no longer had the pain going up his neck. On discharge from the hospital the patient appeared very comfortable, showed no evidence of tension or of mood disturbances. He disclaimed the existence of any fears or phobias at that time. He wondered whether these fears would return when he started to work again. The last report obtained by mail one year after operation indicates that the patient made a very satisfactory adjustment both to his home and work and is apparently free of his former fears and obsessive thoughts.

Such observations may be explained in various ways. One may assume that the preceding frontal lobotomies were incomplete so that only part of the dorsomedial nuclei degenerated and the subsequent electrolytic lesions of this region included cell groups of the dorsomedial nuclei that had remained intact. Such an explanation in a case like the above in which lobotomy had been performed twice before the thalamotomy is possible but not very satisfactory. One could also consider the possibility that the lesion of the dorsomedial nuclei affected connections with parts of the cerebral cortex other than the frontal lobes. Such connections, however, are not known. There remains the third possibility that the lesion of the dorsomedial nuclei interrupted the connections not only with the frontal lobe but also intradiencephalic connections of the dorsomedial nuclei. The anatomy points particularly to connections of the dorsomedial nuclei with the hypothalamus. The appearance of relapses following total frontal lobotomy suggests the importance of such intradiencephalic circuits in the mechanism of emotional reactions.

CONCLUSIONS AND SUMMARY

Thus we arrive at the conclusion that it is not possible to refer emotional reactions to a single circumscribed nucleus within the diencephalon or to its connections with the frontal lobes, but that there exists a multiple representation of this function. Following the elimination of one or two of these circuits others are able to compensate for the loss. As far as our present experience permits us to localize this function the following systems seem to play a part: (a) the connections of the dorsomedial nuclei with

the frontal association areas, (b) connections of the anterior nuclei with the cingulate gyrus, (c) connections of the hypothalamus with the frontal lobe, (d) intradiencephalic connections chiefly between the dorsomedial nuclei and the hypothalamus, perhaps also between the anterior nuclei and the mammillary bodies. (Fig. 3.)

For the systems a, b, and d fibers in either direction have been demonstrated anatomically; centrifugal connections between frontal lobe and hypothalamus probably synapse in the septum pellucidum (Wallenberg) and in the zona incerta (Clark). Centripetal connections between the hypothalamus and frontal lobe are possible by way of the dorsomedial nucleus.

It should be emphasized that in enumerating these circuits we do not wish to submit a definite "new theory" of emotions but only a preliminary working hypothesis that may help to explain our findings, a hypothesis that may be subject to modifications in the light of further observations.

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DISCUSSION

DR. R. W. GERARD, (Chicago, Ill.).—It is a worthy and useful effort to localize neural function as sharply as possible, and it produces a sense of security and satisfaction to be able to allot a particular function to a particular nucleus. In the simpler and more particulate activities of nerve cells and nuclei this has been eminently successful. As more elaborate and total behaviors of the organism are considered, however, it seems progressively less probable that they could depend overwhelmingly on the activity of small circumscribed brain volumes. Thus, to place "consciousness" or "emotion" under the primary jurisdiction of a few neurones anywhere is to invite ultimate refutation. It may well be true that central activity funnels through small paths and nuclei on the way to behavioral expression, and there seems little doubt that the structures discussed by the authors, especially perhaps the hypothalamic region, are predominantly concerned with emotional expression. This might be comparable to the funneling of ordinary volitional behavior through the cortical-spinal system. But "emotion" is not an entity separable from the totality of consciousness and behavior; it describes rather a kind of flavor or tone or color permeating awareness and action. Moreover, while I would emphasize qualitative differences between neurones scattered about the nervous system and from region to region, it seems unlikely that there

could be specific "emotion-producing" neurones or "imagination-producing" neurones. Rather, one is forced from the question "where" or "which" toward the question "how"; and the answer to this last is almost certainly to be sought in the interactions of great numbers of neurones, by fiber connections or field patterns.

I am not surprised, therefore, that the authors' careful exploration has failed to reveal a specific critical emotion-controlling center and has led them to recognize the contribution of many systems. Whether even those that they have enumerated, or any other particular set, could encompass the total mechanism is, of course, a matter for further study. If, as I suspect, the patterns of activity of great numbers of neurones prove more crucial than whether or not any particular neurones participate in the pattern, the final answer will come more from functional than from localization studies. The latter are, however, an essential prelude to the former and I congratulate the authors on their thoughtful contribution.

DR. PAUL D. MAC LEAN (New Haven, Conn.).—The problem of emotional mechanisms is basically one of communication in the central nervous system. One must inquire what are the nature, structure, and workings of the neural apparatus that receives the messages from the internal and external environment of the organism and imparts to them what we describe as emotional feeling and expression. At present we have relatively little knowledge as to the precise structures involved in emotional processes, to say nothing of the refinements by which communication must be handled in these structures.

Dr. Spiegel and his associates have offered further evidence from their clinical experience for believing that the 4 systems they have enumerated are in some way involved in emotional processes. I am curious to know, however, why they have failed to mention another system that has attracted considerable attention in recent years and that was first subjected to experimental analysis by Klüver and Bucy in 1938. This system involves a part of the primitive forebrain that may be designated as the hippocampal formation, together with structures relating it to all lobes of the hemisphere. We may consider the hippocampal formation itself to be made up of the hippocampal and dentate gyri, the hippocampus, and the amygdala. This formation has many and large connections with the hypothalamus and other lower centers. Concerning its afferent connections, we have less information, but there is now evidence from Dell's and our own studies that the vagus sends substantial connections to the anterior part of this formation. By evoked potential methods, Robinson and Lennox have shown that auditory, visual, and somesthetic impressions reach the hippocampus. By strychninization studies, Pribram and I have demonstrated in both the cat and the monkey that the hippocampal formation is related to cortical structures involved in visceral, olfactory, gustatory, visual, auditory, and somesthetic activities. The possibility exists, there-

fore, that in this part of the brain there is a phylogenetically old cortical screen on which may be projected and fused a wide diversity of experience derived from the visceral and external environment of the organism.

Drs. Spiegel, Miller, and Oppenheimer were probably the first to show in 1940 that destruction of the amygdala leads to rage reactions in the cat. This work has subsequently been confirmed by Bard and Mountcastle. During the past 3 years, the Yale Lobotomy Project has paid considerable attention to the possible role of the hippocampal formation in affective behavior. Some of the results of these investigations were summarized in Dr. Fulton's recent Salmon Lectures. Dr. Pribram in collaboration with a number of us has obtained evidence that lesions in various parts of the hippocampal formation will lead to what we interpret as affective changes in the animal, but result in no apparent deficit of what might be called his intellectual capacities. At the present time, Delgado and I are stimulating various parts of the hippocampal formation in the chronically prepared and waking animal. One of the striking findings in both the cat and monkey has been the great variety of viscerosomatic responses that one characteristically sees in fear, defensive, and other so-called affective states.

On the clinical side there is also evidence of the probable role that this part of the brain plays in emotional responses. Sufferers from psychomotor epilepsy, for example, with epileptogenic foci in this or neighboring parts of the brain are afflicted by a wide variety of affective disturbances both during and between seizures. Seizures are characterized by a great diversity of sensory auras, fear

and rage states, and viscerosomatic manifestations.

Here then is some of the evidence that compels one to consider the aforementioned structures among the systems concerned in the central mechanism of emotion. From the standpoint of communication, it should be emphasized that the cortical structures associated with the hippocampal formation are cytoarchitecturally primitive, suggesting that they could deal with information in only a crude way. One might go so far as to infer that this primitive cortical screen registers a picture of the animal's internal and external environment in terms of feeling, and is not capable of the higher symbolic processes we attribute to the neocortex.

In giving this summary I by no means intend to detract from the significant contributions of the authors in defining structures involved in the central mechanism of emotion. Rather, I present it to suggest that this part of the primitive forebrain may be included among the systems considered significant in elaborating emotional experience.

DR. E. A. SPIEGEL (Philadelphia, Pa.).—I agree that in the future functional studies of central emotional mechanisms may prove more important than localization studies. At present, however, it seems necessary to ascertain the areas participating in these mechanisms before one attempts to study their patterns of activity and interaction. I am well aware of the significance of the hippocampus-fornix system of the amygdala since I was the first to observe rage reactions following lesions of these structures. The schematic diagram presented in this paper shows that intradiencephalic circuits are influenced by the fornix system that carries hippocampal impulses.

EMOTIONS AND BIOCHEMICAL FINDINGS IN ALCOHOLISM¹

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The object of our psychologic, psychopathologic, and physiologic studies during the past 10 years has been to obtain a better understanding of emotional reactions. By experimental investigation we have been studying the concurrence of biochemical findings in the blood with the specific emotions of anxiety, tension, and resentment. In the last 3 years, we applied this investigation to chronic alcoholic patients, guided by the formulation that chronic alcoholism is a bio-social phenomenon in which physiological, emotional, and social factors are involved. The definition of chronic alcoholism that our group is using is that a patient suffers therefrom when he uses alcohol to such an extent that it interferes with a successful life and he is not able to recognize its effect, nor is he able to control his alcohol consumption although he knows its disastrous results.

The cases studied came from a large group of patients suffering from chronic alcoholism. In this group we found a few cases of anxiety neurosis. However, most of them had psychoneurotic or psychopathic personalities. About one-third of the patients did not suffer from a well-defined psychiatric illness. Their personalities were rigid and even somewhat compulsive; they were persons in whom self-reliance was not sufficiently developed. Omitted from this experimental study were patients in whom chronic alcoholism developed in the setting of schizophrenic or depressive illnesses.

The results were independently obtained by the 2 authors, by psychological evaluation and biochemical findings in the blood. Once a week these findings were compared. Blood was collected under heparin immediately after the psychiatric examination. This blood

was studied for its effects on the spontaneous contraction of the rabbit duodenum and on the rat's colon and uterus. Its effects were quantified in relation to epinephrine, nor-epinephrine, and acetylcholine. The effect obtained with 1 ml. of blood was measured in centimeters and compared with the effects induced by known solutions of epinephrine, nor-epinephrine, and acetylcholine and expressed as the number of gammas (γ) of epinephrine, nor-epinephrine, or acetylcholine giving an equivalent effect.

In states of anxiety an increase of adrenergic substance was found. The blood used in these experiments was refrigerated and the separation of plasma and red cells was done by centrifugation. The anxiety factor has properties similar to nor-epinephrine in the different sensitivity of the test object used, and in the failure of ergotamine to block its effect. In states of tension an increase of a cholinergic substance that has not yet been identified was found. In states of resentment there is present a cholinergic substance that is shown only when hyoscyamine or atropine is added to the intestine. This substance might be identical with substance *P* of Chang and Gaddum.

The determination of these cholinergic substances was done by collecting the blood with 1 mg. of eserine or physostigmine. This amount of eserine produces an effect that is equivalent to 20 γ of acetylcholine. The value of 20 γ was deducted from the tension substance estimated to be in the blood. However, eserine does not produce the same effect on the intestine with hyoscyamine. Its effect is equivalent to only 4 γ .

Our differentiation of the cholinergic substance into two types is based on the fact that, in over 450 experiments, significant differences were shown in the values obtained before and after hyoscyamine is added. Moreover, in some instances, the two cholinergic substances do not exist together. Sometimes we find the cholinergic substance related with tension without being related to

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Supported by a grant from the Committee on Problems of Alcohol, National Research Council.

From The New York Hospital and the Department of Psychiatry, Cornell University Medical College, New York.

resentment. The reverse has also been observed; *i.e.*, cholinergic substance related to resentment without being related to tension.

FINDINGS

A description of the characteristics by which anxiety, tension, and resentment are recognized and differentiated can be seen in Table 1.

Following the procedure described above, 26 alcoholic patients (16 males and 10 females between the ages of 26 and 45 years) were studied over a 2-year period. Repeated observations of the patients were made from 2 to 26 times.

The psychiatric and biochemical investigations showed during a period of several months a considerable emotional variation of which the patients usually were not aware. However, definite individual patterns of emotional behavior occurred. In the majority of the patients resentment was found to be the most important emotion. In a smaller group, anxiety and related tension were important and, less frequently, tension without anxiety. In no case has anxiety without tension or resentment been found.

Two of the patients who had permission to visit the city indulged in heavy alcoholic drinking. This was confirmed by the presence of alcohol in the urine. When their records were analyzed it was found that they had had considerable amounts of the resentment factor in the blood during the 2 weeks before the use of alcohol and that the tests done upon their return showed an absence of the resentment factor.

Control experiments were done *in vitro* to study the effect of alcohol (1) on the contractions of the intestines of the rabbit, (2) on the resentment factor, and (3) on the response to a given dose of acetylcholine. To the test object and to the blood of patients was added an amount of alcohol equivalent to the alcoholemia produced by 6 ounces of whiskey. The amount used did not produce a direct effect on the contraction of the rabbit's intestines and produced a slight increase in the response of a given dose of acetylcholine. The effect that alcohol has *in vitro* over the resentment factor was studied in the following way. Blood was tested and when the resentment factor was present the blood was

divided into two portions. In one of them alcohol was added. The two portions were again tested at the same time. The result showed no significant difference between the blood with alcohol and the blood without alcohol.

In order to investigate the effect of the drinking of alcohol on the patient's emotions and the corresponding biochemical findings in the blood, the following experiment was carried out: After the patient's emotions had been evaluated in the psychiatric interview, blood was taken. The patient was then offered 6 ounces of whiskey, which he was re-



FIG. 2.—Effect of alcohol on the resentment factor.

20γ ACH = 20 gammams acetylcholine in 1 cc. of distilled water
 50γ HYOS = 50 gammams hyoscyamine in 1 cc. of distilled water.

BL-ES = 1 cc. of blood with 0.2 mgm. eserine
 Upper line: Resentment factor equivalent to 20γ of acetylcholine before ingestion of alcohol.

Lower line: Resentment factor equivalent to 2γ after the ingestion of 6 ounces of whiskey.

quested to drink in amounts of 2 ounces every 10 minutes. The patient drank in the presence of a nurse with whom he might converse freely but no conversation was stimulated by the nurse. The second sample of blood was taken 10 minutes after the last drink. Another test was done 22 hours later.

Alcohol was given in the procedure described above to 11 patients. All of them showed a mild-to-moderate anxiety and moderate-to-marked resentment. Tension was present in 7 of the 11 patients before alcohol was given. The results indicate that alcohol consumption was accompanied by a considerable decrease and even complete disappearance of the resentment factor as will be seen in Fig. 2.

Twenty-two hours after the ingestion of alcohol the resentment factor was as low as the one obtained immediately after drinking; or a minimal increase to 2 gammams was produced.

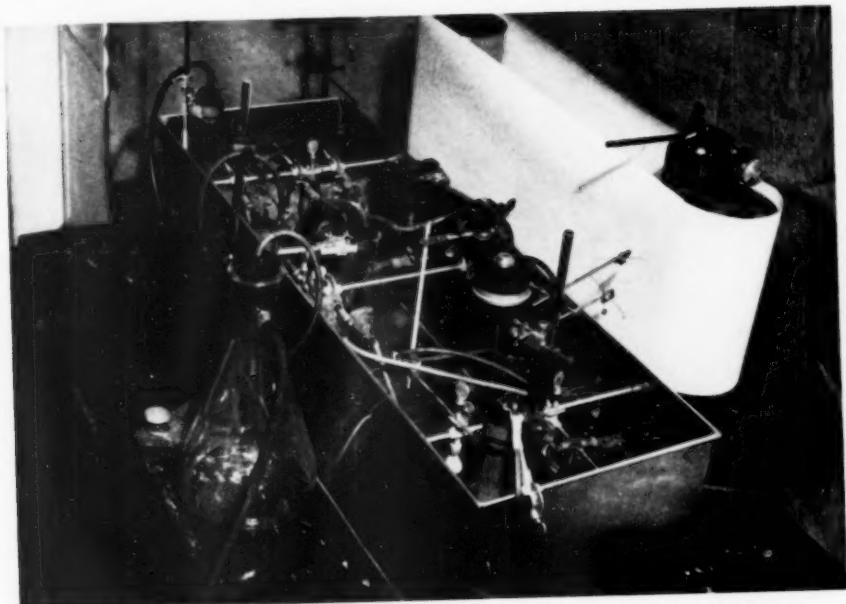


FIG. 1.—Constant Temperature Water Bath Containing One Muscle Chamber.

The isolated duodenum of the rabbit, the isolated colon and uterus of the rat are suspended in the muscle chamber; 40 ml. of solution are bubbled through with 6% CO_2 in O_2 . The movements are recorded on a kymograph by means of an isotonic lever.

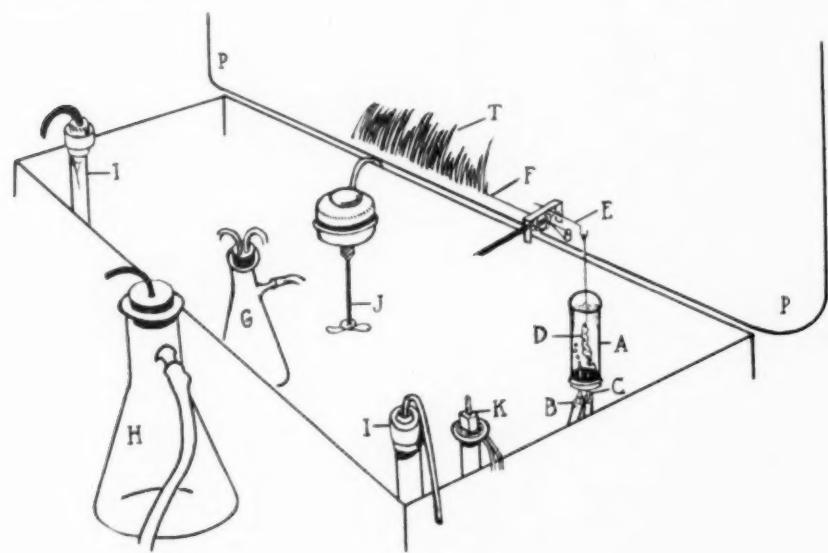


FIG. 1A.

A—Muscle chamber containing strip of isolated duodenum of rabbit.
 B—Tube for oxygen fitted with needle outlet.
 C—Tube for adding Tyrode's solution.
 D—Muscle strip.
 E—Lever.
 F—Pen with ink reservoir.
 G—Flask of fresh Tyrode's solution maintained at bath temperature.
 H—Suction flask to remove Tyrode's solution.
 I—Water heaters with control devices.
 J—Water stirrer.
 K—Thermostatic control.
 P—Paper.
 T—Tracing.

TABLE I
PHARMACOLOGICALLY ACTIVE SUBSTANCES IN BLOOD AND THEIR ASSOCIATION WITH EMOTIONS

	Nor-epinephrine-like substance* (gamma per ml.)	Tension (inner tautness)	Acetylcholine-like substance† (gamma per ml.)	Resentment (bitterness and desire for revenge)	Substance demonstrated after atro- pination‡ (gamma per ml.)
Mild : Anxiety (apprehension)	0.25 to 0.75	Mild ; Feeling taut "Not relaxed"	5 to 15	Mild ; Mild bitterness	2 to 8
Feeling uneasy					
Ill at ease					
Occasional palpitations					
Moderate : Apprehension	1.0 to 2.0	Moderate ; Feeling taut Mild irritability	15 to 30	Moderate ; Bitterness	10 to 20
Occasional anxiety dreams					
Increased pulse rate					
Dry mouth					
Taut throat					
Moist palms					
Gastric distention					
Mild shortness of breath					
Occasional palpitations					
Decreased attention					
Marked : Apprehension, anxiety (aggressive or hostile)	2.0 to 3.0	Marked : Taut, irritable (emotional explosiveness)	30 to 70	Marked : Strong feeling of bitterness and revenge	15 to 30
Palpitations, dry mouth, taut throat, moist hands, etc.		Intense muscular tension		Hostile attitude	
Gastric distention				Irritable	
Urge to urinate				Angry	
Bowel movements				Sarcastic	
Anxiety dreams				Suspiciousness	
Broken sleep				Paranoid misinterpretations	
Decreased retention				Difficulty in falling asleep	
Thinking disorders possible					

* Activity expressed in amounts of nor-epinephrine producing equivalent effects. This substance is not identical with acetylcholine.

† Activity expressed in amounts of acetylcholine producing equivalent effects. The activity of this substance is expressed in amounts of acetylcholine producing equivalent effects in the unatropinized intestine, although the substance obviously is not identical with acetylcholine.

Of the 11 patients studied under this procedure, 7 had tension in amounts ranging from 10 to 50 gammas. Following the ingestion of alcohol the substance disappeared completely from the blood stream. Anxiety was slightly decreased in some of the cases and not modified in others.

The following case will offer an illustration of the influence of alcohol on resentment, anxiety, and tension:

This 46-year-old patient (No. 3965) was subjected from early life to strong competition with his brothers. Unable to succeed at college, he started to drink. Since then his life has been a series of failures, in marriage as in business. He is a dependent, discontented person, critical of others, and feels ill at ease with his successful brothers. All his adult life he has been drinking heavily with occasional periods of severe and prolonged intoxication.

During the first 2 months in the Payne Whitney Clinic, he showed mild anxiety and a steadily increasing resentment. He was tested 5 times and the resentment factor rose from 10 γ to 30 γ .

The patient was allowed to go out, and drank 12 ounces of whiskey; 3 days afterward, he felt guilty, but no definite anxiety or resentment was found. The blood showed nor-epinephrine 0.25 γ , but tension and resentment substances were absent. On two other occasions he drank outside the hospital. On one of them, the test previous to his drinking showed a mild resentment factor and marked tension factor, while the test afterwards showed no resentment or tension.

The patient was not allowed to go out for a period of 2 months, and during this time his resentment increased. Then he was given alcohol under controlled conditions. Ten minutes after the ingestion of 6 ounces of whiskey the resentment factor had disappeared completely.

In the case just described the resentment substance disappeared completely. However, in another case in which the resentment was very high the alcohol produced a considerable decrease, but a strong craving for more alcohol was expressed. Owing to these facts it was decided to perform a third test on a patient who wanted more alcohol.

This patient (No. 4166), who is not yet a chronic alcoholic, was an immature 19-year-old psychopathic girl who had a great need for affection but who felt constantly rejected. She was anxious to do well. During the preceding year she had been drinking heavily. On November 1, 1950, she presented moderate anxiety with no indication of resentment. The blood findings were 27 γ of nor-epinephrine, no tension substance, and mild resentment substance. On November 18, increasing irritability was noticed but she felt less anxious. The

blood findings were nor-epinephrine 1.25 γ , tension substance 60 γ , and resentment substance 12 γ .

Six ounces of alcohol were given to her, after which she was at ease, but had mild resentment and wanted to have another drink. In the blood was found a reduction of nor-epinephrine from 1.25 γ to 1 γ , the tension substance dropped from 60 γ to 15 γ , and the resentment substances from 12 γ to 7 γ .

Two additional ounces of alcohol were given and the patient felt relaxed and had no desire to drink further. No signs of tension or resentment were in evidence. The blood findings were nor-epinephrine 1 γ ; the tension and resentment substances had disappeared completely.

Twenty-two hours later the patient still felt at ease but seemed mildly anxious. The blood study showed a further reduction of nor-epinephrine, and no tension or resentment factor was found.

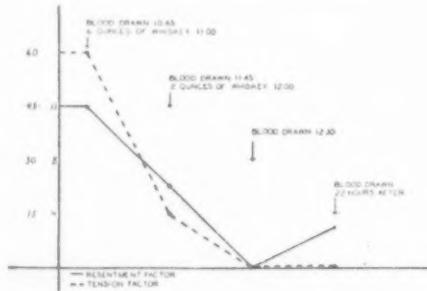


FIG. 3.—Effect of increasing amounts of whiskey on tension and resentment factors.

In our control studies, some drugs have given results similar to alcohol. The tension factor was reduced by the administration of sodium amytal or tolserol. In one nonalcoholic patient dexamethasone abolished the marked tension but not incidental mild resentment, while alcohol abolished the resentment factor promptly but influenced the tension factor little. We have not been successful, as yet, in finding a drug that affects resentment directly.

DISCUSSION

In the largest group of patients, resentment seemed to be the most important factor and was decreased by the drinking of an alcoholic beverage. The amount of reduction of the resentment factor seems to be directly proportional to the amount of alcohol ingested. However, in some of the patients anxiety and related tension seem to be the prominent factors. In those patients alcohol reduced the tension completely and decreased

anxiety but it seems that the effect on anxiety is not as pronounced as on the other 2 factors.

In all alcoholic patients studied, a resentment factor was always present when the patient had a desire to drink. In some of them resentment was the only factor; in others, it was the leading factor among other emotions; in a third group, resentment was not as strong as the emotion of tension. The need for drinking occurred when resentment or tension had reached a degree of marked intensity. After a sufficient amount of alcohol had been consumed these emotions disappeared.

The biochemical relationship of the resentment factor to alcohol is unknown, as is the possibility of an effect of this factor on the metabolism of alcohol.

As has been demonstrated, all these emotions as well as others may be present but in each alcoholic patient there seems to be an individual pattern of emotions that are decreased or abolished by alcohol consumption. It should be stated that there are no indications that there is a special type of resentment in the alcoholic patient. It has also been demonstrated that alcohol may decrease or abolish resentment in nonalcoholics.

It is likely that the type of emotions involved influences the pattern of drinking. If emotions are influenced promptly, e.g., resentment and tension, drinking seems to continue at a leisurely pace. In other patients, e.g., patients with guilt, anxiety, or depressive feelings, and moderate resentment, insufficient relief was obtained with a few drinks. These patients drank a considerable amount in a short time in order to reach a state of intoxication in which they were no longer aware of the disturbing emotions.

Thus far, alcohol has been administered in the form of an alcoholic beverage that the patient recognized. This procedure was used in order to have a situation that corresponded closely to the patient's actual drinking situation. In future experiments alcohol will be administered intravenously in order to determine the influence of alcohol, with exclusion of the psychologic components that accompany the drinking of an alcoholic beverage.

During the experiment the nurse played a

passive role in order to prevent stirring up additional emotions through the patient's conversation. In future experiments the patient will be encouraged to talk in order to study the influence of abreaction and acting-out on alcohol consumption. The influence of the emotions of tension and anxiety by different drugs must be pursued much further. These interesting leads need to be studied carefully and might explain why some alcoholic patients can abstain from alcohol by the use of barbiturates while other patients find barbiturates valueless. It also might explain why some severe psychoneurotic patients turn to alcohol while others find relief in special drugs.

SUMMARY

In a combined psychiatric-biochemical study of patients suffering from chronic alcoholism, emotions were determined by one investigator (O.D.) and biochemical studies were carried out simultaneously by the other (M.F.F.). In anxiety the biochemical substance is apparently nor-epinephrine, while in tension cholinergic substances are present. The substance found in the presence of resentment cannot be defined, but it is definitely not acetylcholine. It was found that the alcoholic patients had varying degrees of resentment when an urge to drink was present. Alcohol relieved the resentment and the corresponding substance in the blood disappeared. In a few patients, tension and correlated biochemical substances were also present and were affected by alcohol. Anxiety was somewhat decreased but not completely abolished.

There are no indications that the resentment in alcoholic patients is different from that presented by other subjects.

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DISCUSSION

DR. JAMES J. SMITH, M. D. (New York City).—Work from several laboratories during the past few years indicates a long overdue attitude of curiosity about the nature of alcoholism. As long as there was contentment with the application of moral or purely sociological and descriptive aspects of alcoholism, the patient suffering this disease was doomed to languish in it. However, now that there is scientific interest concerning the mechanism by which this disease is produced and perpetuated, we may look for great strides in the elucidation of its nature.

The work from Dr. Diethelm's laboratory is part of the new era in the study of alcoholism: an era that should see real progress into the causes and treatment of what some people consider to be the fourth in importance of our major public health problems.

Much of the lack of interest in alcoholism has been caused by lack of new and rewarding approaches to the problem. In the past, treatment has been so generally discouraging that few physicians have interested themselves in this medical problem. Indeed, the first major modern approach has been on the part of the lay public. To have what is generally considered a disease so neglected that lay forces find it imperative to rush in to fill the void is surely not to the credit of the medical profession.

The work from Dr. Diethelm's laboratory raises a number of interesting questions, and points the way for much further investigation. It would be interesting to apply this technique to animals in which states of frustration and anxiety have been developed by conditioning, and in which an appetite for alcohol results.

The fundamental fact about alcoholism is that it is a disease, and that it has, therefore, an etiology. There is no effect without an adequate cause. Does this work give us the adequate cause for alcoholism? I think not. There must be some factor, probably a common denominator in alcoholics, that operates in the presence of resentment, or tension or anxiety. For surely, as Dr. Diethelm's work in the past has shown, not all resentful people are alcoholics, and there would appear to be far more tension and anxiety in the world than there is alcoholism. But these emotions do seem to act as trigger mechanisms in producing particular episodes of drinking.

A possible common denominator here is hypo-

thalamic function, with consequent fluctuations in over-all autonomic nervous system activity. Certain findings in chronic alcoholics, the most striking of which are sleep and appetite disturbances, suggest that a hypothalamic disorder may be present in chronic alcoholics. We reported to the second Clinical ACTH Conference our findings in a series of 73 chronic alcoholics subjected to the standard epinephrine and ACTH eosinophil response tests. Whereas 34% had a negative ACTH response, 75% had a negative epinephrine response. This suggests the possibility that in the chronic alcoholic the inadequate epinephrine response may be due to a pituitary or hypothalamic defect. In studying this effect we administered epinephrine alone, and epinephrine and alcohol concomitantly, to approximately 20 chronic alcoholics. It was interesting that, whereas the usual adrenaline effects of nervousness, tremor, and anxiety were produced by epinephrine alone, in the majority of these patients these adrenaline effects were usually abolished or greatly diminished when 50 grams (approximately 5 ounces) of alcohol, as beverage whiskey, were given concomitantly. Many of these patients stated that the "shakes" they experienced following adrenaline were identical with the "shakes" that led them to take alcohol. It is important to note that, although the substance that Dr. Fleetwood finds present in states of anxiety is thought to be nor-adrenaline, nor-adrenaline itself, when injected, does not produce the characteristic symptoms of anxiety as adrenaline does.

The fascinating and fundamental question is which comes first, the feeling of resentment, or the increased titer of a chemical substance as determined by bio-assay. In other words, does the emotion produce the chemical, or does the chemical produce the emotion? We must consider the possibility that the emotion or behavior disturbance is a reaction to a chemical disturbance in the internal environment, as well as the possibility that the emotional disturbance produces the biochemical change. Furthermore, it is possible that the increased titer of humoral substance is a mere concomitant of the emotion. That is, does the patient drink to abolish the resentment, or to reduce the titer of the humoral substance?

Since it is our opinion that there is a fundamental neuro-endocrine defect in alcoholism, it is interesting to see this work from Dr. Diethelm's laboratory.

RHEOSCOPIC STUDIES OF EXPRESSION¹

METHODOLOGY OF APPROACH

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In the fall of 1949 a laboratory dedicated to the studies of expressive motions was opened at the Veterans Administration Hospital, Lexington, Kentucky. The first tasks were to disentangle the skein of problems, to find a theoretical basis, and to develop adequate techniques. Now, as we begin to see results, it may be fitting, before publishing details, to give a general review of the situation.

The importance of expressive motions in the practice of everyday life and in medical activities in general can hardly be overrated. Actual knowledge of expression, however, is far from being commensurate. Paradoxically, everyone in his understanding of expression is at the same time expert and ignorant; as St. Augustine said about time: "As long as no one asks me, I know the answer; the moment I want to explain it to an enquirer, I do not know."³

It is through expression that we comprehend another being as a living and experiencing creature. It might be claimed, therefore—and with good reason—that expressive phenomena are the true mark of objects of psychological research that distinguishes them from all other things. Even if we hesitate to accept these views as axiomatic, we cannot deny that expressive motions direct interpersonal relations to a very large extent. Age, sex, group, race, color, epoch, language—these do not constitute obstacles. We take it for granted that a mother realizes how her baby feels long before he is capable of pronouncing the simplest words. But also—and this is more startling—long before he is capable of distinguishing a circle from a square, the baby responds to the expression

of the mother whether she is friendly or angry, cheerful or sad. Guided by expression, mother and child form in their reciprocal understanding a synkinetic group.

Expressive understanding even transcends barriers separating species from species. We can talk to a dog in many languages; he understands all of them, not because he is polyglot but because he responds to the expressive values of intonation. These facts present an interesting but also a perplexing problem. We will not ascribe to the baby "inference by analogy" nor to the dog reaction by empathy. In order to give an account of the phenomena of expressive motions we may well be forced to revise the principles of psychology.

Verbal communication is limited to those who speak the same language—a language that they once had to learn. Expressive communication is *universal*; it does not have to be learned. There are no schools that offer instruction in expressive motions; if they did they would do more harm than good, for expressions are not intended as such. Intention usually interferes with their performance. Although highly communicative, they are not, or need not be, produced for the purpose of communication. This spontaneous production is paralleled by an equally *spontaneous comprehension* of expression. There is no doubt that we can to some extent acquire control over our expressions. We can also hope to improve our understanding of them—otherwise such research as this would be meaningless. However, we can travel a long distance without ever reflecting upon expressive motions.

This spontaneity of expression guarantees its *reliability*. Expressive deception is much more difficult to accomplish than verbal falsification. How often do our expressions reveal our true feelings against our intentions! In case of a discrepancy between words and expressions we rely upon the expressions rather than the words. Through an ironical contrast of content and expres-

¹ Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

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³ St. Augustine, *Confessions*, Book XI.

sion everyone grasps instantaneously the true intention. "But Brutus says he was ambitious; and Brutus is an honorable man." By veiling, irony reveals.

The psychiatrist, in his endeavor to lift the mask of insanity, finds in expressive motions salient clues. Expressive motions dominate psychiatric judgment to no less degree than everyday-life practice. No psychiatrist aware of the melancholic expression of a patient will trust his words that deny his depressive mood. Gait, voice, breath, gaze betray the patient. Anticipating an impending suicide we may even double our measures.

Although in psychiatry we depend so much on our observations of expressive motions, we have very little precise communicable knowledge. We have impressions, intuitive impressions; but even if our impressions are correct—as they sometimes are—we rarely can give a clear account of them. We cannot demonstrate, we cannot prove. The psychiatric situation does not differ from that of everyday life. However, our predicament is more serious because we are limited to opinions where we are entrusted with judgments.

In the search for a remedy one first has to make clear why such a wide gap should exist between practice and knowledge. There are many reasons:

1. Our very familiarity with expressive motions prevents us from seeing them as problematic. Why should we bother about expressions as long as they serve us well in our need for orientation, for adaptation, and for cooperation with others?

2. Our understanding of expressive motions is a kind of performance, an acting more than a knowing. Expressive motions flourish in the immediateness of personal contact. They seem to evanesce the moment we make them an object of observation; they fade when the I-You relationship is switched to an I-He, when observation takes the place of partnership. Experimentation, therefore, threatens to destroy the very object we want to study.

3. Expressive motions are frequently fleeting, transitory; they are gone with the wind, leaving no trace, giving no opportunity of ascertaining them; once gone they are

not repeatable at will. Also, for this reason expressive motions seem to defy experimentation.

4. Knowledge is directed toward what is regular; expressive motions are unlimited in number. While in many cases of psychological research we can be guided by language, here it is of no direct help. Our vocabulary has only too many words that signify nuances of expression.⁴ The situation resembles that of some African languages, which have 50 or more words to name shades of one color, especially of brown. The reason here is the same as there. Practice is interested in particulars and in their discrimination while knowledge looks for the basic structure—the one in many.

5. Our understanding of expression is a global reaction. This is in full agreement with the fact that expressive motions are a unity into which many single motions are integrated; we are not sad on the left side and cheerful on the right. Our expression is "*uno tenore*" and, accordingly, it is expressed by the whole organism. We may realize at first glance in what mood our partner is; however, when asked to explain why we think so, we may find it difficult to give any detailed answer.

6. A satisfactory theory of expressive motions is still lacking. Without an adequate theory we cannot expect to order the multitude of expressions into a finite group of basic attitudes, or natural dimensions. A mere collection of facts, a wholly empirical approach, will not yield meaningful results.

Obviously, then, the problems found in research on expression are manifold and of differing weight and dignity. They may be grouped into 3 main divisions: theoretical, technical, and experimental.

Theoretical Problems

As observations are answers to questions, pertinent observations depend on reasonable questions provided by theory. There are no plain facts open to disinterested inspection, certainly not in a field where observation so closely borders on interpretation, as in the study of expressions. Research is always

⁴ The same can be said of emotions, a coincidence that points to the kinship of expressions and emotions.

directed by theoretical assumptions, whether we are aware of them or not. The theory, therefore, has to be formulated—at least tentatively—when or before experimentation is started. The results obtained under the guidance of theory will in turn confirm or refute its validity. If valid, the theory should also enable us to survey and to chart the accumulated facts; in other words, a valid theory should contain a prescription for a systematic order of observations.

While a theory is indispensable, it need not be a new one. However, there are strong reasons that recommend a revision of the existing theories. In the past many attempts have been made to arrange the multitude of expressions into a systematic order. None of them has been fully successful. Although their failure may be partly owing to the lack of adequate technical devices, the blame has to be laid primarily to the deficiencies of the theories.

The history of theories of expression reaches far back. As in so many other fields, the recorded history of them begins with the work of the great Greek thinkers.⁵ All through the ages, down to Darwin, Wundt, and Klages, the theoreticians were inclined to see in expressions outward, physical signs of inner, psychical conditions. They took it as their task to explain this relation between the *sign* and the *signified*, which here obviously is one aspect of the mind-body relation. Everywhere in psychological research the mind-body problem is present; in some areas of expression the theorist cannot evade the mind-body problem. He is, therefore, forced to go beyond the frontiers of psychology and psychopathology.

The mind-body problem is not answered simply by denying its existence. Psychological thought has become deeply ingrained with the Cartesian dichotomy of mind and body. We can renounce all allegiance to it and still remain bound by it; it reappears under many disguises—as epiphenomenon, as sensory data; it operates in the aliases of stimulus-response, of reality testing. Under

⁵ See Pollnow, Hans: "Historisch-Kritische Beiträge zur Physiognomik," *Jahrbuch der Charakterologie*, 5: 150, 1928; Buhler, Karl: *Ausdrucks-Theorie*, Jena, 1933; Allport, Gordon, and Vernon, Philip: *Studies of Expressive Movement*, New York, Macmillan Company, 1933.

its influence, psychological science has drifted further and further away from everyday-life experience. In the process of analytical reduction the phenomena themselves have been obscured and distorted. The study of expressions urges a re-evaluation of the phenomena; this will lead to a rehabilitation of *experiencing*. At this point we shall find a tenable solution of the mind-body problem that contains—still enveloped—a theory of expression. In unfolding it, we shall also obtain a method of discovering the basic categories of expression.

A thorough discussion of these complex problems must be given elsewhere.

Technical Problems

Compared with former days we are in an advantageous position. The modern laboratory has devices that facilitate research in expressive motions. Early investigators were limited by inadequate technical equipment. Indeed, the raw material of their studies was not so much the original phenomenon of expressive motions as some derivative; they had to be content with either the physiognomic mask (Porta), portrayal by an actor (Engel), artistic painting and drawing (Charles Bell), the imitation of expression by electric stimulation (Duchenne), the collection of diversified observations (Darwin), or such expressive precipitates as handwriting (Klages). Today we can study under experimental conditions in a wide range of controlled variations: the facial expression, the posture, carriage, gesticulation, voice and intonation, shifting our attention from one manifestation to the other as we please. With the camera, the motion picture, and sound recording we are able to arrest the fleeting, repeat the unique, analyze the global, and reintegrate the parts into a whole.

The term "rheoscopic" was selected to signify such applications of film-recording techniques,⁶ which have already been used

⁶ The word rheoscopic is coined in accordance with "microscopic" and similar terms. As the microscope makes accessible to critical sight (scope) the minute (micron), rheoscopic procedures open to vision the fleeting (rheo). If it is permissible to compare techniques that are rather unsophisticated with instruments brought near to perfection

to some extent by psychologists like Buehler, Lersch, W. Wolff, and others.

New methods bring new problems, obstacles, handicaps. Progress is never a pure gain. Photofloodlights and camera produce an artificial situation, irritating and bewildering, which induces shyness in two forms. In a photo-studio, light has an almost corporeal character; it does not seem to emanate from a source that illuminates the room in spheres of diminishing brightness; it fills space equally everywhere, not sparing any friendly area of claire-obscur; in its penetrating obtrusiveness it cuts off all retreat into privacy. Plunged into this mercilessly revealing light of the laboratory, the patient finds his innermost being exposed to the scrutinizing eye of the camera. Certainly these are not surroundings conducive to unguarded behavior—just the opposite, the patient becomes self-conscious and feels isolated. Sound-recording, if done openly, adds its share to the denaturalized environment of the studio. Sound-recording interferes with the casual, informal, noncommittal frankness of conversations, which are not phrased for deposition and re-examination.

If lens and recorder disturb naive production, the next thought may be to move the recorder out of sight and to hide the camera behind a screen. First thoughts seldom are final solutions. Hiding the equipment would preserve the naïveté of the patient but would affect the spontaneity of the experimenter and put him into a predicament, the more embarrassing if the patient should ask point-blank whether recording is being done. While there is no great technical difficulty in camouflaging a microphone, the one-way screen does not present—not even from a technical point of view—a good solution. Absorbing a great deal of light, such a screen aggravates the lighting problem. It is hard to explain to a patient the stupendous brilliance of illumination when no camera is visible. Even if the patient remains unaware of the camera, natural contact with him suffers under the surveillance of a peeping lens.

The psychological disturbance caused by mechanical devices will not be cured by the addition of more devices. Such deficiencies

one could say that the rheoscopic technique magnifies time as the microscope magnifies space.

must be compensated for in the sphere of interpersonal relations. If the patient is adequately informed about the character of the laboratory, if warm personal contact is kept during the performance, if the scenario catches his interest, he may overcome his initial amazement. Actually, only a few patients refuse to cooperate, most of them neurotics. The severely psychotic patient, limited in the modulation of his behavior, appears less annoyed in this situation than one would expect.

The scenario sets short scenes for which the cameraman has to prepare. Even if the photographer completely understands the idea of the experiment and his first love is not photography, he has to turn his attention to the camera, sometimes at the most inopportune moments. Under the conditions of these experiments we are limited to "first nights"—to performances without rehearsals. Unfortunately, the protagonist does not know the part assigned to him; he has to learn it while playing. Unfamiliar with the script, the patient may display the most interesting behavior during the interludes, just at a moment when the photographer is busy measuring light and distance, focusing or rewinding. Here a second camera might be a valuable asset. This camera should be simple in construction, requiring less careful adjusting, needing no tripod nor dolly. The disadvantage of another operator must be weighed; the more people present, the more public the performance, the greater the intrusion into the privacy of the patient.

Even under ideal conditions, the camera will never cover everything we should like to retain. It is frequently more accurate but at the same time less flexible than the observer; it is selective but its selection does not always coincide with the intentions of the experimenter. The lens does not see exactly like the eye. The camera adds and omits; in focusing the figure it neglects ground and periphery. In reducing colors to black and white, it intensifies the contrast. In projecting three-dimensional space on a two-dimensional plane, it creates a new organization, which is more abstract but easier to survey.

While the camera is no computer that does all thinking for us, it is indispensable for

the manipulation of time. Rheoscopic studies begin with—perhaps it is better to say culminate in—the analysis of the finished film strip. One must not forget that the film strip is no mere copy of the original events. Taken by itself, it provides a new medium in which operations, absolutely inapplicable to the original events, become possible for the first time. On the film, action is frozen, time is brought to a standstill. The continuity of motion is dissected into temporal segments, into phases. In this new medium one can reverse time, return to the beginning, and repeat motions unrepeatable in the original setting. Whereas in the reality of time one moment excludes every other moment, here earlier and later phases may be brought together for simultaneous observation. What has been extracted from the current of time may finally be returned to the temporal flux for enlightened inspection.

Shown with an ordinary projector, the presentation of the strip runs parallel to the original events. This procedure, by no means useless, is insufficient for rheoscopic analysis. The potentialities invested in the film are better actualized by a "film editor," an apparatus that, simple as it is, permits the singling out of individual frames, speeding up, slowing down, and repeating. However, because of the smallness of the screen and inadequate optics, the use of the editor is limited. It can serve only one or two observers. For demonstration and didactic purposes one has either to reshape the film completely or to resort to a special projector, now available on the market, that satisfies all requirements except sufficient flexibility in speed.

Rheoscopic analysis is not synonymous with slow motion. The two techniques are more different than similar. In slow motion the time enlargement does not exceed a ratio of 1:4.

Slow motion has successfully been used for the analysis of motion in neurology, athletics, and industry. In all these fields it has proved useful because the picture, which paraphrases the tempo, can be compared with the movements undistorted in speed. In industry, furthermore, the emphasis is shifted from the motor performance to a de-

tailed analysis of the path traversed. In the study of expression, where we are not interested in the way but in the motions themselves—which usually are neither uniform nor repeatable—the usefulness of slow motion technique is limited.

Experimental Problems

The laboratory devoted to the study of expressive motion at the Veterans Administration Hospital in Lexington, Kentucky, is still in the early phases of the program outlined. In the short time that has elapsed since its beginning we have not been content to find out what has been done in the past, what must be done in the theoretical field, and what can be done technically, but we have gone ahead and applied our principles to concrete cases. The results have been encouraging; they will be published in due course. Moreover, it has become clear that such experiments are valuable beyond the demarcation line set by the original plan, in such ways as the following:

1. The laboratory is a training ground for the physician in a special type of observation easily transferable to the ward.

2. The laboratory is also a testing ground for the patient, an addition to the general diagnostic instrumentarium that could well stand comparison with many familiar tests. The situation in the laboratory is substantially different from the conditions of staff room, ward, interview; one knows considerably more about a patient after he has acted out a scenario. Therefore, even discounting all interest in the particular problem of expression, a certain merit could be attributed to the procedure in itself.

3. With growing knowledge and understanding of expression new problems come into sight. Expression may lead to an understanding of the distorted world in which a patient lives when all other means of communication break down. Modes of expression cut across the established clinical differentiations. Varying where the clinic unifies, unifying where the clinic differentiates, they urge, in their elemental nature and trustworthiness, revision of clinical distinctions. Thus, in this research, goal and end do not coincide.

TRANSORBITAL LOBOTOMY IN CHRONICALLY DISTURBED PATIENTS¹

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The problem of the chronically disturbed patient is one that challenges the psychiatrist in all mental hospitals, and in a large institution such as the New Jersey State Hospital at Trenton the problem is aggravated by the accumulation of the criminally psychotic from the entire state, as well as by the transfer of highly disturbed patients from other state institutions. Even without such an influx of chronically disturbed patients, most, if not all, of our state hospitals are overcrowded and inadequately staffed with trained personnel. Legislators are reluctant to provide funds for new construction and, even were such available, it is unlikely that sufficient qualified personnel could easily be obtained. It is therefore not only a psychiatric problem but also one of economics at the state hospital at Trenton as in other public institutions.

In November 1949, the first transorbital lobotomy was performed in that hospital on the most difficult patient to manage in the entire institution. The immediate results were so remarkable that a plan was begun in January 1950 with a twofold purpose: The improvement of the chronically disturbed patient and, as a result, the alleviation of crowding and the need for more staff personnel. A secondary aim was to compare the results of transorbital lobotomy with those of prefrontal lobotomy, a project involving the latter having already been under way. Within 3 months it became quite evident that the advantages of the transorbital lobotomy were greater than those of the prefrontal type and there were no apparent disadvantages. This study does not purport to compare the two, but briefly the transorbital method has the following advantages: It is a far simpler procedure thus allowing many more to be done, with less morbidity, lower

mortality, less pre- and postoperative care, and much better results. The last factor, of course, is of paramount importance. The prefrontal lobotomies were therefore discontinued.

This paper will report the results in the first 200 cases operated on by the transorbital route. Each patient has been followed for at least 6 months, many for more than a year. As the problem was the care and treatment of the chronically disturbed patient, the criteria for selection of patients for operation were simply these: how sick is the patient

TABLE 1

Number of cases.....	200 *
Male	99
Female	101
White	171
Colored	29

* 4 nonoperative deaths not included.

and how much previous treatment has been given without response? In other words, all of our patients had had at least one and usually most of the various therapies generally given for this type of patient—electroconvulsive, insulin, fever, histamine, psychotherapy, occupational therapy, and recreational therapy, as well as others used less frequently. These patients were all difficult care problems and most had been kept in seclusion for a number of years. We began with the criminally psychotic, the most difficult group of patients in the State of New Jersey. The operative technique has been described elsewhere by Freeman and need not be repeated here.

The cases are almost evenly divided between the sexes but it will be seen in Table 1 that the white patients greatly outnumber the colored. These figures are generally in accord with the hospital population.

It is always a problem to classify and define the improvement a group of patients

¹ Read at the 107th annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 7-11, 1951.

makes under a particular form of therapy, but in this series we have attempted to group the responses as simply as possible. Our first group, those who have left the hospital, needs no further definition. The second group, that considered good, are those patients who have made pronounced improvement, are being considered for discharge or parole, or who are working around the hospital and do not need the great amount of supervision required before operation. The third group, called fair, includes those who have made a definite stride forward, yet cannot be included in the good group. The great practical factor in this group is that seclusion is no longer required. The fourth group contains those who have made little or no improve-

ment. The fifth and last group includes the operative deaths.

It is apparent that, although more females have been discharged, the total number of males in the first 2 groups(70) is considerably higher than the females(46). We are of the opinion that the reason for this discrepancy lies in the personalities of the supervising nurses. The supervisor on the male side is more dynamic and spurs the men on to greater efforts in their own behalf. The nurse in charge of the females, on the other hand, is more complacent and tends to seclude the patients rather than risk them on an open ward. Such action does not allow the female patients the greatest opportunity for improvement.

Thirteen cases have been reoperated, one at his own request. These patients were considered to have made a poor response to the first operation. The second operation involves more extensive cuts than the first, in that sweeps are made at 4, 5, 6, and 7 centimeters from the lid rather than just at 5 and 7 centimeters. Similarly 6 patients who have had previous prefrontal lobotomies with poor results have had transorbital (Table 7).

The following summaries of the records of 3 of our patients give an idea of the better results obtained.

S. M., a 38-year-old white male, was admitted to the criminal department of the hospital for the second time May 18, 1936, and diagnosed paranoid condition. Owing to his ideas of persecution he became resentful, antagonistic, and belligerent. His capacity for making trouble among the inmates and for the attendants was unusual. He was considered the worst management problem in the entire hospital and had been kept in seclusion for many years. A transorbital lobotomy was performed November 7, 1949. By November 30 he began to exhibit marked improvement, became friendly, sociable, somewhat euphoric, and appeared to have lost his ideas of suspicion. He continued to improve steadily and was promoted from the criminal department to the civil department December 24, 1949. Four months after the lobotomy he was so much improved, so cheerful and helpful on the ward that he was given the privilege of short visits to his home. He was released for regular trial visit in custody of his brother 6 months postoperatively and his career and adjustment have since been followed up in the after-care clinic. He has done so well that after 6 months at home his trial visit was extended.

H. S., a 50-year-old chronic paranoid schizophrenic, had been in continuous residence at the State Hospital, Trenton, for 22 years. He was

ment. The fifth and last group includes the operative deaths. The inclusion of patients in the various groups has been made not only by follow-up interviews by the authors, but by the impressions of experienced nurses and attendants who have daily contact with the patients. Table 2 shows that 58% of the patients have either left the hospital or are greatly improved, and that another 11% are sufficiently improved to require much less supervision. It should be stated that many of the good patients could have left the hospital if relatives or other responsible people could be found.

Clinical diagnoses and duration are shown in Table 3, the majority being cases of schizophrenia.

Many of these patients had been treated at other hospitals earlier but the major portion of their hospitalizations has been at Trenton. The schizophrenics are further divided in Table 4.

Results obtained in the various diagnoses are indicated in Table 5.

It has been the impression of the authors

TABLE 3
DIAGNOSIS AND DURATION OF ILLNESS

	Number	Duration of illness in years		
		Longest	Shortest	Average
Schizophrenia	132	34	1	13
Manic Depressive Psychosis	9	20	3	8.7
Involutional Psychosis	5	19	1	6
Psychopaths	13	20	2.5	8
Psychosis—Mental Deficiency	20	45	1	13
Psychosis—Epilepsy	14	22	1	9
Miscellaneous Organic Psychoses	7	19	2	8.5
Total	200	45	1	11.7

TABLE 4
DIAGNOSIS OF SCHIZOPHRENIA

	Number	Duration of illness in years		
		Longest	Shortest	Average
Simple	16	25	4	13.6
Hebephrenic	41	21	1	13
Catatonic	34	34	1	13
Paranoid	41	34	2	12
Total	132	34	1	13

TABLE 5
RESULTS BY DIAGNOSIS

	Out of hospital	Good	Fair	Unimproved	Oper. death
Schizophrenia	16	63	17	35	1
Simple	1	8	1	6	—
Hebephrenic	5	21	4	11	—
Catatonic	4	16	4	9	—
Paranoid	6	18	8	9	—
Manic Depressive Psychosis	2	2	..	5	..
Involutional Psychosis	2	3
Psychopathic Personality	3	2	2	6	—
Psychosis—Mental Deficiency	1	9	3	6	1
Psychosis—Epilepsy	7	..	6	1
Miscellaneous Organic Psychoses	2	4	..	1	—
Total	26	90	22	59	3

RESULTS IN PATIENTS WITH PREVIOUS OPERATION

	Out of hospital	Good	Fair	Unimproved	Deaths	Total	T. O. L. twice	Out of hospital	Good	Fair	Unimproved	Died
Males	10	60	6	21	2	99	T. O. L. twice	2	6	2	4	2
Females	16	30	16	38	2	101	T. O. L. following pre- frontal lobotomy	2	1	1	2	2

inordinately proud of his German origin, domineering and threatening, adjusted very poorly on all wards, exhibited faultfinding, lying, backbiting, and bootlicking. He was very clever in scheming to set one attendant against another and to upset ward routine. He became sexually dangerous to certain members of the staff and was placed in seclusion for 7 years prior to operation. Following his first transorbital he made a remarkable recovery for 2 months, a really changed personality. He relapsed in the third month to his old self. A second lobotomy was done at the end of the third month and he again showed a rapid remarkable recovery that appeared to be more permanent. He became cheerful, obliging, eager to please, energetic, and a willing worker on the ward. Soon he was promoted to parole of the grounds and continued to adjust perfectly and was allowed to leave the hospital 3 months after the second operation. A home with the Salvation Army was found for him. He is now self-supporting, sociable, willing to take advice, and has retained his natural drive to better himself. He is being carried and advised by the after-care clinic. His adjustment and rehabilitation have been very satisfactory.

V. E. B., a 54-year-old white female, was admitted on January 23, 1943, for the first time. She was transferred to the Woodville State Hospital, Woodville, Pennsylvania, April 18, 1943, but later re-admitted March 25, 1945. On both admissions the patient was diagnosed schizophrenia paranoid type. During her entire residency in this institution and up to the time of operation the patient was sullen, resistive, belligerent, and entertained numerous ideas of infidelity against her husband and persecutory ideas against many members of the hospital staff. She was a very difficult patient to supervise. She began to show improvement in her general behavior about 2 weeks following the transorbital lobotomy on October 10, 1950, and since that time her improvement has been steady and progressive to the point where on January 4, 1951, she was presented before the medical staff for trial visit consideration. She was released from the hospital on January 11, 1951, and has continued to adjust very well since that time.

DISCUSSION

The statistics presented above we believe speak for themselves, yet certain points are worthy of further emphasis.

The patients used were considered hopeless as far as any degree of improvement was concerned. Practically all had been confined in small seclusion rooms for varying lengths of time up to 20 years with an average duration of illness of 11.7 years. To take 200 such patients on whom many other types of therapy had failed, perform a relatively simple procedure, and get 26 out of the hospital, improve 90 so that they are useful in their

environment, and cause a fair hospital recovery in another 22 patients is noteworthy. For the first time the doors of many seclusion rooms at the New Jersey State Hospital are open. It would have been worth while if only one patient of the 200 had been released to society. It is impossible, however, to over-emphasize the great conservation of hospital personnel brought about by the general improvement of the group as a whole. In round figures seven-tenths of the patients require much less supervision, whereas only three-tenths show little or no improvement and, therefore, require the same amount of care. It can be stated with emphasis that no case has become more difficult to manage following operation. We should like to stress again the economic gains and the release of hospital beds and freeing of trained personnel for the care of more acute cases.

We do not wish, however, to be enthusiastic to the point of indiscriminate operation before other types of therapy are used; but with failure of other treatments after a reasonable length of time we feel that this procedure is indicated. Such social change takes place outside a mental hospital as years go by that long-term patients are difficult to rehabilitate even if their behavior is most suitable. Relatives and friends tend to disappear, so we urge that, if such operation is contemplated, it be performed as soon as possible after one year of failure of other therapies.

The 3 operative deaths reported do mean that a certain risk is involved. With more rigid physical criteria we believe 2 of these deaths could have been avoided; but denying the operation to other patients of similar physical status would have excluded some of the cases who have made good recoveries. In our opinion, a mortality rate of 1.5% is not great and a higher one could have been endured considering the ends gained.

The differences in improvement between males and females is interesting and emphasizes the fact that following the operation the patient must not be returned to seclusion if he is to get the maximum response.

We believe, but can offer no figures in support, that transorbital lobotomy renders the patient more amendable to electroconvulsive therapy. It is our habit to give this

treatment to all those in whom the response to transorbital lobotomy is considered unsatisfactory after 3 months. Failing any improvement on shock therapy a second transorbital is performed. Our program is progressing at the rate of 8 to 12 operations a week. A future report is intended as more results accumulate.

SUMMARY

Two hundred cases of transorbital lobotomy are reported with marked improvement in over one-half of cases of chronically disturbed patients. The results according to diagnosis are indicated.

We urge that this type of operation be considered for all chronically disturbed patients in whom other less strenuous forms of therapy have failed after one year.

The economic advantages in the improvement of such a group of patients are stressed.

DISCUSSION

DR. LAWRENCE C. KOLB (Rochester, Minn.).—Several years ago in attempting to evaluate the therapeutic results of lobotomy, I was impressed by those reports in which case presentations were provided and continued over a reasonable period of postoperative observation. The attempts at statistical reporting of outcome from this procedure, like most other presently practiced psychiatric therapies, were such that it was only possible to conclude that they provided an illusory statement of the value or lack of value of the procedure.

The 3 case reports provided by Dr. Wilson and his associates are impressive as examples of the therapeutic results that may follow transorbital lobotomy. It is encouraging to be able to discharge from a state hospital, as a result of operation, patients who have been chronically disturbed and hospitalized for such periods as 13, 22, and 7 years prior to the operative procedure. The likelihood of such discharges in the ordinary course of state hospital treatment is not great. If we review experiences such as those reported by Penrose in his paper on "Results of Special Therapies in Ontario Hospitals," we note that at least 5 of 10 patients will be discharged at the end of 2 years, and slightly more by the end of 3 years' duration on conservative therapy alone. Under the circumstances, it would be of interest to learn how Dr. Wilson would select, at the end of the first year of hospitalization, those 4 patients in 10 who for certain will remain in the hospital throughout the duration of their lives and, therefore, would be the proper patients for treatment with lobotomy. Certainly, we have no exact measuring rod for such selections at the present time.

It is commendatory that Dr. Wilson and his as-

sociates have stated modestly and clearly the limited and practical objectives of their therapeutic attempt and the reasons for making this attempt. The psychiatric staff of many state hospitals have informed me on many occasions that the psychosurgical procedures do reduce the aggressive activity of the disturbed and, thereby, the nursing care needed for them. There is no question that the group of patients selected for operation in this series is a most difficult one. Yet, it is the group from which we might expect the most conspicuous changes in behavior judging from over-all lobotomy experience. It has been repeatedly emphasized that violent, belligerent, and destructive behavior is most likely to be modified by psychosurgical procedures.

On the other hand, practically all of the 200 patients studied here had been confined to small seclusion rooms for varying lengths up to years prior to operation. Apparently one criterion of improvement is the ability to remove the patient from seclusion. Unfortunately the policies regarding seclusion of patients vary so greatly in different hospitals and even in the same hospital from time to time that whether a patient is in seclusion may not be considered a reliable comparative factor either to assess the severity of the behavior disturbance from patient to patient or as a means of evaluating the outcome of therapy.

For example, one of our larger state hospital systems in which special attention is being paid to the use of restraint and seclusion requires superintendents to report regularly the number of patients in seclusion. Any isolation of a patient, a locked door at any time during the day, is reported as restraint. A report from this system recently shows that the average daily number of patients in seclusion during a given month varied between the hospitals from 5.1 per 1,000 resident patients to 71.3 per 1,000. In other words, the extent of seclusion as such may indicate hospital policies, attitudes of nursing staff as well as degree of disturbance in behavior.

I take issue with the statement that the statistics presented "speak for themselves." If outcome of therapy in this most complex field is to be presented by means of statistical measures, the patient groups must be sufficiently great to allow a breakdown of the data not only in terms of the various diagnostic categories, but also age, duration of illness and hospitalization, previous attacks, and then be presented after a sufficiently long follow-up period. Furthermore it should be compared with what is known of the natural history of the disease or of the therapeutic efficacy of other procedures. Penrose has suggested that a 5-year follow-up period be used as a minimum before reporting outcome much as the surgeons report the efficacy of various procedures for cancer on the basis of the 5-year cure. There is no question that there will be an attrition rate in the "out of hospital" and "good" groups reported by Dr. Wilson. They have occurred in every other series of patients subjected to frontal lobe surgery for emotional disorders. Until we have available such reports, it will not be possible to compare the therapeutic efficacy of

transorbital lobotomy with any other psychosurgical procedure or, for that matter, with any therapy on a statistical basis.

The statistical analysis presented here indicates that in all patient groups treated there were patients with illnesses of short duration, that is, of 1 to 3 years. It would be helpful in understanding the full import of outcome of this series of cases to

know whether duration of illness coincides with duration of hospitalization, and, secondly, to know how many of the 26 patients discharged from the hospital had an illness with duration of hospitalization of less than 3 years. In closing, it is my hope to have the pleasure of hearing a further report on the long-term outcome of this series of patients at a later date.

PHYSIOLOGICAL RESPONSES TO HEAT STRESS AND ACTH OF NORMAL AND SCHIZOPHRENIC SUBJECTS¹

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Inadequacy of physiological response of schizophrenic patients to psychologic and other forms of stress has been described by Pincus *et al.*(1) after an extensive investigation of such patients. They state that there was "a highly significant failure of normal adrenal stress response in the schizophrenic population as compared with the control population." This they believe to be due to adrenal cortical failure.

This observation has not been confirmed by other workers(2, 3, 24), who have demonstrated that schizophrenic patients, after the stress of electroconvulsive therapy, have about a 65% decrease in circulating eosinophils and lymphocytes, thus indicating that the pituitary-adrenal mechanism was functioning. A report from this laboratory(4) has also demonstrated that circulating lymphocytes of schizophrenic patients decrease after epinephrine in a manner comparable to controls. Hoagland and Pincus(5) have objected that electroshock was too gross a stress to demonstrate a partial adrenal cortical deficit and that epinephrine effects were not comparable to other forms of stress.

The present report is concerned with further investigation of the pituitary-adrenal cortical response of normal and schizophrenic subjects to heat stress, epinephrine, and ACTH.

METHODS

The methods used for measuring adrenal cortical activity were the decrease in circulating lymphocytes used by Hoagland(6) and the decrease in eosinophils as used by Forsham and Thorn(7). The uric acid-creatinine ratio of urine, which was found by the latter to increase after injection of ACTH, was also determined.

¹ Read at the 107th annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 7-11, 1951.

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The subjects in this study were patients from the neuropsychiatric wards of McMillan Hospital and from the Malcolm Bliss Psychopathic Hospital. The subjects were divided into 3 groups (Table 1), schizophrenics, normals (medical students and staff members), and nonschizophrenics (normals, depressives, and psychoneurotics).

All subjects were in a postprandial state with nothing to eat after midnight on the days previous to the tests. Nineteen subjects were placed in a heat cabinet (temperature 106° F. for 45 minutes). The head was exposed and water was allowed *al libitum*. Although dry heat from carbon filament lamps was used, the profuse sweating in a closed cabinet must have soon increased the humidity to the point where evaporation was at a minimum. This procedure was used as a mild heat stress producing only slight increases in body temperature. Seven chronically ill (2-5 years) schizophrenic patients without clear evidence of deterioration and not used in the heat cabinet studies were placed in a hypertherm for approximately one hour and the rectal temperature was raised 3 to 5° F.

Pulse, blood pressure, and oxygen consumption (Benedict-Roth apparatus) were observed before entering and immediately upon leaving the heat cabinet, and at the same time blood sugars and hematocrits were determined (method of Wintrobe(8)). Hematological studies were made on capillary blood at approximate intervals with the heat cabinet, the hypertherm, and epinephrine. Differential counts were prepared in the routine manner. The white blood counts and circulating eosinophil counts were performed by the method of Randolph(10). The significance of differences was evaluated by computing *t* values(9).

Urine specimens were obtained from 8 of the subjects after voiding the morning specimen for the period approximately 2 hours before the test and 2 and 4 hours after leaving the hot box. The urinary creatinine and

uric acid were determined by the methods of Folin (11), modified for use with the photoelectric colorimeter.

Some of the same subjects were used in other experiments for testing the effect of epinephrine (0.01 or 0.005 mg./kg. IM).

RESULTS

Following exposure to heat, the decrease in eosinophils in all groups varied between

measured by computing *t* values. The schizophrenic, normal, and nonschizophrenic subjects all showed a significant decrease in eosinophils following heat (Table 2), without, however, significant intergroup differences in initial level or degree of change (Table 3). Analogously, all groups showed a similar decrease in lymphocytes, differing from the eosinophil response only in the smaller magnitude and later occurrence.

TABLE 1
EFFECT OF HEAT ON CIRCULATING EOSINOPHILS *

Subject	Diagnosis	Base	0 minutes after heat	30 minutes after heat	60 minutes after heat	120 minutes after heat
R. B.	Schizophrenia	120	90	53	70	105
L. W.	Schizophrenia	213	83	126	120	118
V. T.	Schizophrenia	100	93	57	27	83
M. C.	Schizophrenia	93	107	87	87	107
F. B.	Schizophrenia	67	107	60	113	113
R. K.†	Schizophrenia	142	135	210	120	130
E. G.†	Schizophrenia	330	223	225	270	200
J. W.†	Schizophrenia	190	120	93	155	130
C. E.†	Schizophrenia	303	113	157	183	210
B. I.†	Schizophrenia	58	27	50	33	27
M. A.†	Schizophrenia	40	15	17	23	33
L. L.†	Schizophrenia	102	70	85	66	80
M. W.	Depression	206	80	—	86	104
A. M.	Depression	386	394	403	340	256
N. T.	Psychoneurosis	140	47	40	87	120
R. H.	Psychoneurosis	154	150	96	100	156
A. B.	Psychoneurosis	196	116	126	76	116
P. B.	Psychoneurosis	83	73	40	40	83
T. M.	Psychoneurosis	332	347	415	400	375
J. H.	Normal	146	74	80	110	148
T. L.	Normal	153	156	106	100	160
M. S.	Normal	120	110	76	94	150
S. J.	Normal	130	120	70	40	94
S. H.	Normal	152	138	68	50	142
E. R.	Normal	125	95	70	65	110
M. S.	Normal	138	130	69	100	135

* Per cu. mm.

† Rectal temperature raised in hyperthermia.

30 and 70%, the maximal response appearing between 0 and 90 minutes after the completion of the heat cabinet or hypertherm stimulus (Table 1, Figs. 1-3). It can be seen that the pattern of response in the schizophrenic subjects differed from the normal and nonschizophrenic groups only in that the return of the eosinophils to the basal level required a slightly longer time. The response of 4 patients who showed no decrease may be seen in Fig. 4; these 3 schizophrenics and one psychoneurotic will be considered later.

The statistical significance of the observed differences in response pattern to heat was

The eosinophil response seems to be the more reliable measure since the error involved in the absolute eosinophil count is less than that involved in the absolute lymphocyte count. Also only one determination is required for the former in contrast to 2 determinations for the latter. Hills, Forsham, and Finch have also pointed out that the eosinophil response is the more consistent of the two (12). The hematocrits showed a decrease in plasma volume ranging from 0 to 2.0%, leaving no doubt that the changes in blood cell counts were not related to changes in blood volume.

Changes in the uric acid-creatinine ratio following heat were not significant.

Since some subjects, including some normals, became very anxious while under heat

± 5 mg. % (with 2 exceptions). No significant changes were noted in the pulse or blood pressure.

In early experiments the variable response of different individuals to identical situations

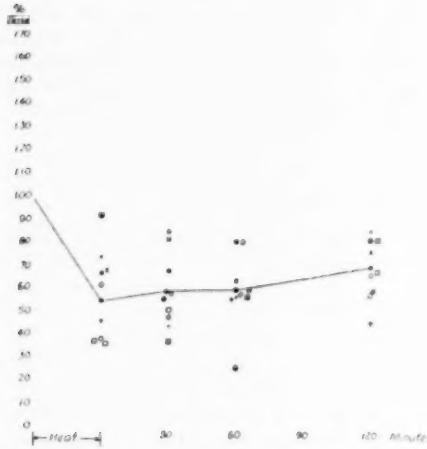


FIG. 1.—Effect of heat on circulating eosinophils in schizophrenic subjects.

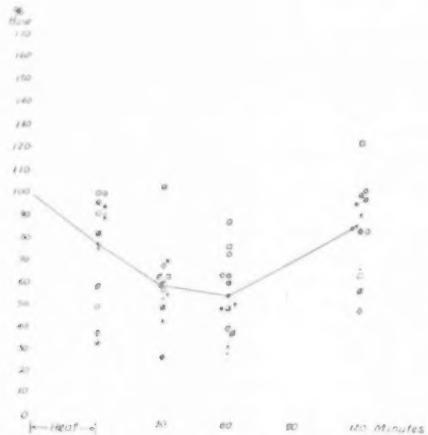


FIG. 3.—Effect of heat on circulating eosinophils in nonschizophrenic subjects.

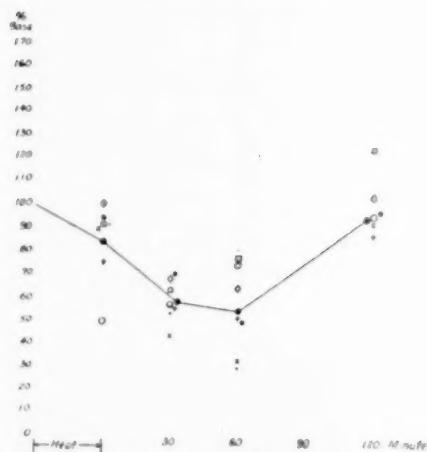


FIG. 2.—Effect of heat on circulating eosinophils in normal subjects.

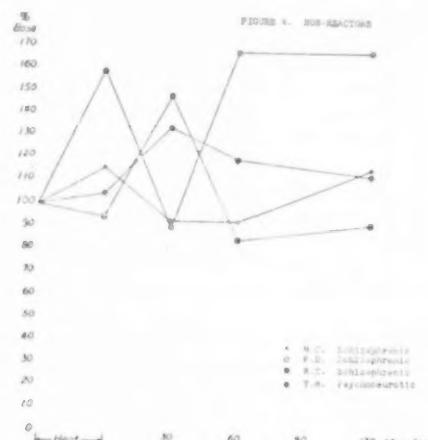


FIG. 4.—Nonreactors.

stress, some sympathetic stimulation might have resulted. Blood glucose was measured before and at intervals after entry into the heat cabinet and hyperthermia as an index to possible epinephrine release. The changes in blood glucose were slight, being within

in the heat cabinet suggested that some adapted better to increased environmental temperature than others. This was further emphasized by the recorded oral temperatures. Some showed a distinct small increase of 1 to 2° F. while others were able to main-

tain their normal temperatures. The small changes in oral temperature were not considered unusual for exposure to heat, as Benedict and Dubois (13) found that, when

TABLE 2
t TEST OF SIGNIFICANCE OF DIFFERENCES OF CIRCULATING EOSINOPHILS WITHIN DIAGNOSTIC GROUPS

Group	<i>t</i> value			
	Base 0 min- utes	Base 30 min- utes	Base 60 min- utes	Base 120 min- utes
Schizophrenics	2.53*	2.65*	3.42†	2.50*
Normals	2.33*	12.20†	5.27†	.38
Nonschizophrenics	2.50*	3.67†	4.58†	1.54

* 5% level of significance.

† 1% level of significance.

To study further the adaptation to increased environmental temperature, the adrenal response was also studied in 7 schizophrenic patients in whom the rectal temperature was actually increased to 5° F. in the hyperthermia. These patients (with the exception of one—R. K.) all showed a significant decrease in eosinophils (Tables 1 and 2).

Since epinephrine has been demonstrated to increase oxygen consumption (15) and also to stimulate the production of adrenal cortical hormones (16), 2 different doses of epinephrine (0.01 mg./kg. and 0.005 mg./kg.) were administered to a number of the subjects to obtain different levels of increased metabolic rate. Following both doses of

TABLE 3
INTERGROUP STATISTICS OF CIRCULATING EOSINOPHILS AFTER HEAT

Group		Base	0 min.	30 min.	60 min.	120 min.
Schizophrenics	<i>N</i>	12				
	Mean	146*	99	102	106	111
	S. D.	90	50	63	69	53
Normals	<i>N</i>	7				
	Mean	138	118	77	80	134
	S. D.	12	28	12	26	22
Nonschizophrenics	<i>N</i>	14				
	Mean	176	145	120	120	154
	S. D.	81	97	128	105	73

* *t* values of differences among the 3 samples for the various intervals following heat were not significant. The values ranged from 0.30 to 1.73, a probability less than the range of 2.16-3.71 which is necessary for significance at the 1% level of confidence.

they were exposed to a blast of dry air at 94° C. (201° F.) for 2 hours, their rectal temperature rose only 0.3°, whereas the metabolic rate increased 7%. Dubois (14) has also emphasized the fact that a single temperature reading only gives "the level in one small part of a large body." While there was some correlation in these experiments between the temperature rise and the lymphocyte and eosinophil fall it was not entirely consistent. Since the oral temperature under these conditions probably would not have indicated the over-all change in body metabolism, it was decided to measure metabolic rates. It was of interest to find that in these individuals, subjected to the same environmental temperature under identical conditions, the increase in oxygen consumption varied greatly, from 1 to 53% above the normal resting level. From Fig. 5 it can be seen that there is a fair positive correlation between the increase in metabolic rate and the fall in circulating eosinophils.

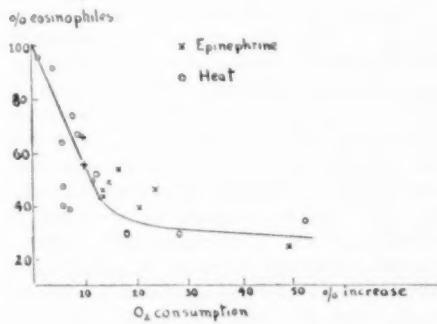


FIG. 5.

epinephrine there was an immediate increase, followed by a decrease, in the number of circulating eosinophils, ranging from 65% to 24% of the initial value. Neither the reduction of eosinophils nor the increase in metabolism was directly proportional to the dose of epinephrine (Fig. 5). It can be seen that, as in the experiments with heat, the eosino-

phils decreased as the metabolic rate increased. The relationship was again linear until the metabolism had increased 15% above normal and the eosinophils had been reduced 60%. This appeared to be a nearly maximal decrease, due to a physiologic mechanism of stimulation of the anterior pituitary.

ACTH when injected in 25 mg. doses was shown by Forsham and Thorn(16) to produce even greater decreases in eosinophils.

As previously mentioned, it will be noted from Table 1 and Figs. 4 and 5 that 3 of the schizophrenic patients and one psychoneurotic patient did not react to heat with an increase in temperature or metabolic rate as did the other patients or controls, nor did they show a decrease in eosinophils. In an attempt to explain the unusual response of these 4 patients, the pituitary-adrenal cortical system was shown to be intact in 3 of the nonreactors tested. An eosinophil response occurred following epinephrine, and also in one patient following ACTH.

Preliminary studies being done in this laboratory show that, in 24 schizophrenic patients tested, 5 mg. of ACTH produced an eosinopenia of the same order as reported by Thorn(16) in normal subjects.

DISCUSSION

Pincus *et al.*(17) have presented a large amount of data supporting their contention that the adrenal cortex of schizophrenic patients does not respond to various forms of stress or to injected ACTH. A previous paper from this laboratory(4) showed that schizophrenic and other psychotic and neurotic patients responded to epinephrine with the same lymphocytopenia as observed in normal subjects. The schizophrenic patients showed a marked decrease in lymphocytes and eosinophils following electro or insulin shock, which also has been shown by other investigations(2, 3, 18, 19). Our conclusion that this indicated a functioning pituitary-adrenal cortical mechanism in schizophrenics has been criticized by Pincus(5) on the ground that shock treatments were a severe type of stress that might "break through" and evoke an adrenal cortical response. The use of epinephrine was also criticized because it increases the blood sugar, which in itself causes a lymphocytopenia. Long's(20)

and our own experiments(21) on rats show definitely that the response to epinephrine is independent of increases in blood sugar. Indeed, the response to the hypoglycemia of insulin depends on the fall in blood glucose and the consequent liberation of epinephrine since it is completely abolished when the blood glucose is maintained at normal levels. Pincus(17) also states that about half the schizophrenic population respond with a lymphocytopenia to hyperglycemia. In our experience the lymphocytopenia is small and does not always occur in either normal or schizophrenic subjects. The changes come earlier and are of shorter duration than those observed after ACTH or epinephrine. With regard to the overwhelming stimulus due to shock treatment, according to our preliminary observations and those of others(2, 3) the response is of the same order and duration as that produced by 25 mg. ACTH(16), which was used by Pincus(5).

The present experiments fail to confirm the report of Pincus and Elmadjian(22) that following the stress of heat (105-112° F.) normal subjects demonstrated a decrease, schizophrenic patients an increase in lymphocytes. In 75% of the schizophrenics we tested, the adrenal cortical response to heat was not significantly different from that of the controls. Only 4 patients failed completely to respond to heat, and of these 3 were shown to have an intact pituitary-cortical system. The other patient was not tested.

The subjects of this study who failed to have an increase in body temperature or metabolic rate also failed to show changes in blood cells. While the correlation between metabolic rate and eosinopenia is not impressive, it does suggest that the effects of epinephrine and heat in stimulating the production of ACTH may be related to their capacity to increase cellular metabolism, resulting in an increased demand for cortical hormone, as suggested by Sayers(23). The chief obstacle in accepting such an explanation is that small increments in metabolic rate produced marked decreases in eosinophils and lymphocytes. The sustained nature of the increase in metabolic rate is probably important. Further work involving other forms of stress with a measure of the total increase in metabolism will be necessary before definite

conclusions can be drawn with regard to the role of metabolic rate in the control of pituitary and adrenal cortical activity.

Pincus and Hoagland found defective response in 75% of schizophrenic patients treated with ACTH. Hemphill and Reiss (24, page 154) state, "The response to ACTH, however, was, contrary to the findings of Pincus and Hoagland, positive in over 70 per cent. of all cases." Experiments done in this laboratory show that, in the 24 schizophrenics tested, 5 mg. of ACTH produced an eosinopenia of the same order as reported by Thorn (16) in normal subjects.

CONCLUSIONS

No statistically significant differences were found in the physiological responses of chronically ill schizophrenics as compared with normal controls and nonschizophrenic patients.

Moderate to severe heat was used for stress. The circulating eosinophils and lymphocytes were measured before, during, and after exposure to heat. The base values for circulating eosinophils and lymphocytes during and after heat stress were also similar in the 3 groups.

In preliminary studies the uric acid/creatinine ratios were also not remarkable.

It was found that even the small dose of 5 mg. of ACTH produced an eosinopenia comparable to that found in normal subjects.

It should be noted that Hoagland and Pincus after studying more patients have concluded that lymphocyte response to ACTH and to heat stress does not reliably differentiate schizophrenics from nonschizophrenics. They have not reported data on eosinophils. However, they found that urinary 17-keto-steroids, sodium, potassium, uric acid, and cortins do differentiate schizophrenics from controls exposed to stress of various kinds and to ACTH.

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UTILIZING THE COMMUNITY AS A THERAPEUTIC RESOURCE¹

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The goal of psychiatric treatment is the return of the individual to the community with the ability to utilize community resources for his personal, social, and vocational adjustment. Frequently, these goals are forgotten in our efforts to relieve patients of their symptoms and effect a "cure." We all have had the experience of seeing patients able to function satisfactorily, and even become symptom free, within the hospital, only to fail in an adjustment to community living. They then return to the hospital despite efforts of the hospital, family, and community agencies. Too often we rationalize these failures by pointing out that we deal with a group of individuals whose outlook for the future has always been poor and whose ultimate destiny was probably life in a mental hospital anyway. Sometimes, this is valid but in Roanoke we are convinced that, with greater effort, the number who must ultimately fail can be reduced. With this in mind we have developed a program planned primarily for those patients who, in the past, failed to adjust satisfactorily despite one or more efforts to return them to their home community. Although we have placed much emphasis upon vocational planning and adjustment, we do not consider our objective that of vocational rehabilitation. Our goal is a work therapy situation similar to that in which the patient was engaged in the hospital in a more complex although still carefully selected and controlled environment. While the extent of our program is not great, we have been impressed by its effectiveness in rehabilitating a significant number of patients who might have expected to occupy a hospital bed much of the time during the remaining years of their life. What we are doing is not new.

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Most mental hospitals have similar programs but scant attention has been given to such efforts in the psychiatric literature.

Ideally, a complete hospital treatment program encompasses proper evaluation and treatment of a patient's problem, a progressively less sheltered and less protected environment, and the development of personal assets in a situation as nearly approximating community life as possible. In this process the patient and his family are assisted from the time of admission to anticipate discharge. Despite the effort made there are large numbers of patients who fail. In analyzing our failures, we find that many are due not so much to rejection by the family or community as to the patient's uncertainty and lack of confidence in himself. This reduces his ability to shift from a sheltered, controlled environment to complete responsibility for himself.

Most of the patients with whom we are concerned in this paper have made a fairly satisfactory adjustment on open wards of this hospital. These periods varied from a few months to as much as 13 years. Most were engaged in hospital therapeutic programs, either in the manual arts therapy shops or in occupations about the hospital, under the supervision of physical medicine and rehabilitation personnel. Most have relatives who, after attempts to return home had failed, were entirely satisfied to allow the patient to remain in the hospital. Most had come to accept the hospital either as their home or as a shelter from the world.

Three years ago we were able to recruit an individual for the staff of the physical medicine and rehabilitation service as a training officer or rehabilitation specialist. His assignment was to work with this group of patients in an effort to help them bridge the gap between hospital and community living. Although he had no special knowledge of psychiatry and little experience in dealing with individuals with overt emotional problems, he had had experience in teaching, as well as several years of work in the field of

vocational rehabilitation. More important, however, than his education and vocational experience are his personality assets. He is a warm outgoing person not easily discouraged who accepts a challenge with enthusiasm and, above all else, likes people. As a result of his special assignment in physical medicine and rehabilitation, he comes into almost daily contact with the particular group of patients we are trying to reach. Our procedure is now well enough organized to be a real part of our therapeutic armamentarium.

Patients are selected by ward physicians and referred to the training supervisor for potential placement. As opportunity arises, an effort is made to discuss with the patient his plans for the future and his attitude toward leaving the hospital. The training supervisor tries to determine the patient's educational background, previous employment record, and the kind of work he would like to do should he be permitted to leave the hospital. If the patient's vocational plans are inconsistent with his past record, he is referred to a vocational supervisor for an aptitude test. Should the patient seem to need encouragement, he is invited to go on trips the training officer makes to supervise other patients working outside of the hospital. About this time, he is referred to the social worker for encouragement in undertaking the plans that need to be developed. The social worker interprets the program to the patient's family, so that they may be given reassurance and also develop support and encouragement for the patient in undertaking employment away from his home.

With the patient's needs in mind and with knowledge of employment resources in the community, communication is opened with possible employers. The employer must first be motivated to undertake the responsibility of assisting the patient in making a successful social and economical adjustment. Considerable time is spent in orienting the employer as to how he can make a real contribution to the recovery of an individual who has been sick for a long time. Emphasis is diverted from the amount of money that can be made by the employer from the man's labor, and placed on the opportunity to restore the patient to society. The employer is also shown not only that this will require a willingness

to devote more time to the patient than ordinarily would be spent with a new employee but that it will also be necessary to interpret the patient's problem to other individuals with whom he may come in contact. We rarely find an employer not willing to accept this challenge. Most of them, indeed, have become enthusiastic and interested. Some employers have taken as many as 6 patients despite difficulties and problems. Some have even become so interested that they, on their own initiative, visit prospective employees at the hospital prior to their leaving in order to establish a comfortable and encouraging relationship. When a suitable spot is found, an interview is arranged for the patient at the place of business.

In discussing the matter with the patient, he is told that we have found what we think to be an opportunity that will interest him. He is asked whether he would like to go on a visit to look over the situation, and decide on his own whether he wants the job. It is important to give the patient a sense of having bargaining power. He is not told, of course, that the prospective employer has been prepared in advance and is willing to meet him better than half way to sell the patient on taking the job. The patient is encouraged to conduct his own employment interview and discuss the various aspects of the job, including the salary. In every instance we have found that money is a secondary issue to the patient. As improvement occurs advancement in salary comes with it. If the patient is satisfied with the job and arrangements, a definite date is set for him to begin work.

The next step, and frequently the most difficult, is to find the patient a satisfactory place to live. This is at times arranged at the place of employment. If this cannot be done, arrangements are made for room and board in the immediate neighborhood. Frequently, in addition to the preparation and orientation of the family with whom the patient is to live, there is the problem of arranging for a certain amount of supervision and encouragement in the home during his adjustment period. Roughly, the same approach is made to the family as to the employer; that of a challenging opportunity to assist a sick person to get well. After the

family has been prepared, a visit is arranged, so that the patient can meet the people with whom he is to live and satisfy himself about the arrangements.

It is, of course, necessary to assure the employer and the foster family that the hospital will continue to give supervision to the patient and will deal with any problem that may arise, day or night. Our training officer gives detailed instructions as to how he may be reached by 'phone and exactly what to do if he is not available. Personnel at the hospital who may be called about the patient are also advised of the fact that the patient has been placed and are prepared to lend assistance when necessary.

From the outset patients are encouraged to improve their situation on their own initiative should they have an opportunity to do so. Supervision is maintained until the patient has indicated, by constructive planning, that he is able to get along without hospital help. The training officer has primary responsibility for this supervision, although it has been occasionally necessary to call upon the ward physician, social worker, and other hospital personnel to deal with the problem. Sufficient funds are obtained for the patient prior to his leaving the hospital to permit him to live until he receives his first pay check. The patient is encouraged to be responsible for own financial arrangements and is always advised of the exact financial transactions that are being made. Occasionally, it is necessary for some special supervision to be given to the handling of the patient's money, either by the employer or in the foster home but the patient is always provided with pocket money.

The case report below illustrates many of the problems involved. This patient is currently under supervision.

A male 26-year-old veteran was admitted to the Veterans Hospital at Roanoke, Va., in May, 1937. He had been discharged from the army with the diagnosis of hebephrenic dementia praecox.

Information is meager but so far as can be determined his early life and development were not unusual. He was born in a small town in Virginia, one of 6 siblings. According to the family physician, several members of the family had been hospitalized for treatment of psychiatric disorders. The veteran completed the seventh grade in school. Prior to enlistment he had worked as a laborer and carpenter's helper. He served 2 periods of military

service and his adjustment is described as excellent. While on duty in Panama, he established a common-law relationship and a children resulted from this union. Nothing unusual was noted until November 6, 1936, when he went to a police station in New York City and told a bizarre story of having been delegated a "G" man and indicated that he had unusual powers. He was hospitalized by the army and a diagnosis of dementia praecox, hebephrenic type, was made.

On admission at Roanoke, he was quiet and volunteered little information concerning himself. He was unable to recall many details of his personal life. He complained that voices from the radio were calling him "putty face," a nickname he had been given as a child. He heard voices calling him obscene names and describing him as a gangster by the name of "Lucky Luciano." The diagnosis of dementia praecox, hebephrenic type, was continued.

The patient adjusted well to hospital routine. He was described as quiet and cooperative although he continued to express delusional ideas and reacted to auditory hallucinations. After 6 months, he was placed on privilege status where he continued to make a satisfactory adjustment. In October, 1937, he went on trial visit in custody of his eldest brother, the only relative expressing interest in him. While we have little information about his behavior while on trial visit, the records indicate that he was returned to the hospital in April, 1938, because his family felt uncertain as to his ability to get along outside of the hospital. Shortly after his return, he was again placed on the open wards where he continued to make an entirely satisfactory adjustment. For many years, he worked in various assignments about the hospital, being described as cooperative and a good worker, although he rarely displayed evidence of interest or initiative. With the establishment of the manual arts therapy automotive shop in October, 1949, the patient, because of his past interest in mechanics, was assigned to this activity. There was a striking and definite improvement in his condition for the first time. In June, 1950, the automotive shop technician described the patient as "an excellent mechanic and doing fine work. His actions, speech, and behavior are normal. His attendance is excellent and he gets along well with other patients." There was also noticeable improvement in his adjustment on the ward and in other activities about the hospital.

In August, 1950, consideration was given to placing the patient on trial visit but his family was not interested in accepting responsibility. His last contact with a member of his family was in 1943 when a brother visited the hospital. Since it was not possible to arrange for this patient's supervision at home he was referred to the rehabilitation specialist to determine whether a suitable placement could be made in the community. It was realized that the patient would require close supervision and attention at least for some time. He was considered as "incompetent."

The training specialist made it a point to meet the patient and establish a friendly relationship with him while he was engaged in the automotive shop.

The patient first expressed little enthusiasm for leaving the hospital but did not seem to resent the approach made by the rehabilitation specialist. At about this same time, the patient was also referred to the social worker for discussion of his future plans. To stimulate his interest further, he was invited to go with the training specialist on supervisory trips to see other patients, many of whom this patient already knew. He expressed special interest in the activity of a friend working for a local motor company.

The following excerpts are quoted from reports submitted by the training officer to the ward physician:

October 27, 1950: The prospect of employing S. as a janitor for the H. Motor Company has been discussed with Mr. H. several times and the way for employment has been paved. On this date, S. first visited the place of employment. At first, Mr. H. was dubious since S. does not make the best impression. Mr. H. finally told S. that he would hire him and give him a trial period starting next Monday. No fixed salary was established in advance since Mr. H. agreed to provide a completely furnished "efficiency apartment" at the place of business and it was decided by Mr. H., with the concurrence of the patient, that the salary would be established after one week's employment.

November 2, 1950: Mr. H. is concerned about S.'s psychotic behavior. He explained that the patient seemed to sit around a great deal, constantly smiling. Mr. H. could not see anything humorous about the shop. He stated that he did not give S. orders but left the sweeping and cleaning strictly up to him. It was again explained to Mr. H. that it was necessary to supervise and guide S. To give meaning to this statement, it was again pointed out that S. had been a patient in the hospital for 12 years, where he did only what he was told to do and therefore for the time being would have to be directed from task to task until a routine was learned. It was pointed out that Mr. H. should not be concerned about the patient's constant grin since this was just a mannerism. He was assured that these disturbing factors could be changed and that the training supervisor would talk to the patient about them. It was again pointed out that S. had excellent possibilities and that understanding and patience would be the only method by which they could be realized.

The patient was seen and nothing especially unusual was noted in his behavior. It was explained that daily bathing was necessary because of dust, etc., resulting from cleaning.

November 9, 1950: Mr. H. stated that he had noticed improvement in patient although he expressed concern because the patient was eating just one item, sardines, and Mr. H. did not feel that this was a substantial diet. Mr. H. had begun to realize that it was necessary to direct S. to the various tasks in and about the garage but he assured the training officer that he was anxious to do everything in his power to help the patient.

S. seemed to be happy with his job. At the end of the first week his salary was established at \$12.00.

November 15, 1950: Mr. H. indicated that S. was getting along better. His daughter was assisting the patient in buying his groceries.

S. was pleased although he could not understand why it was necessary to spend so much money for food. He enjoyed preparing his meals.

December 1, 1950: Mr. H. stated that S. was getting along well but that he had to warn him about picking up cigarette butts and smoking them. Mr. H. had told the patient that he had sufficient money to purchase cigarettes and that he did not wish him to smoke "snipes" again. It was explained that S. was very "close" with his funds and that he would need supervision because, without it, he would undoubtedly deny himself things that he needed.

S. was seen and was obviously quite happy. It was noted that patient's hands were severely chapped and when the training supervisor mentioned this to the ward physician he prescribed a bland ointment. The employer agreed to see that the patient actually used it.

December 13, 1950: S. shows a surprising change, not so much in mood as in appearance. He was cleaner than he had ever been since his release from the hospital and had begun to show initiative in keeping himself presentable. He was voluntarily using the ointment with good results. He had gained weight and was purchasing his own cigarettes rather than picking up butts from the floor and street.

Mr. H. seemed to feel that real progress was being made. He had tried to get S. to go to church but was unsuccessful; the patient left to go to church but returned in one-half hour. Mr. H. was concerned since the patient spent most of his free time reading and listening to the radio and he felt that S. should engage in some recreational activities.

January 12, 1951: The employer expressed enthusiasm and interest in patient's progress. S. was beginning to take initiative in jobs about the garage and no longer required so much supervision and direction.

S., who had never been communicative, actually began to contribute to conversation. He volunteered that he enjoyed his work, liked his employer, and thanked the training officer for coming to see him.

February 14, 1951: Mr. H. no longer feels it necessary to give patient any special supervision in the performance of his duties and the appearance of the establishment indicates that S. is doing outstanding work. Last Sunday S. accompanied Mr. H. to the automobile races and has indicated an interest in going to an occasional movie.

S. is entirely happy, has no complaints and has gained weight. He is beginning to express interest in activities outside of his work and makes it clear that he appreciates the interest and visits of the training supervisor.

Over the past 3 years, 68 individuals have left the hospital through this program. Only 9 of them have had to return to the hospital.

Of these 9 cases, 4 failures were due to the development of physical disabilities that would not permit the patient to continue to live outside of the hospital. These 68 individuals had been admitted to the Veterans Hospital in Roanoke an average of 2.5 times. In many instances there had been one or more hospitalizations elsewhere. They had remained in the hospital an average of 575 days, one for as long as 13 years. While patients in the nonpsychotic category had the highest readmission rate (averaging 3.5 times as contrasted with an average of 1.5 times for patients in the psychotic categories) the average length of hospital stay for these cases was 196 days, as compared with an average of 829 days for patients with more severe psychiatric disabilities.

At present, the training supervisor has 12 patients under supervision but, in view of current adjustment, it is likely that 2 of them will no longer require further hospital support. Of the 68 cases placed during the past 3 years, we no longer maintain contact with 49. These patients have made satisfactory adjustments. While we do not have follow-up studies with regard to all 49 individuals, it is more than likely that we would have had contact with them if their adjustment had not been satisfactory, since we are the only VA Hospital within a large area with sufficient beds to admit patients with psychiatric problems. These patients have, in the past, sought assistance at Roanoke when this was necessary.

We have placed 31 patients with schizophrenic reactions, 6 manic-depressives, 11 with organic disabilities, and 26 who would fall into the category of nonpsychotic behavior reactions.

Ordinarily, the type of job selected has been of a simple nature, usually that of a laborer or unskilled worker. Most of our patients have been placed on farms, or as waiters or dishwashers in restaurants, or as janitors or unskilled workers in garages, hotels, and filling stations. Some have been employed as printers, or bookkeepers, or in other occupations commensurate with their previous training.

It may be considered that we have set up a foster home program, although there are differences as well as similarities to the or-

dinary foster home situation. These patients are motivated to leave the hospital by a desire to become self-sustaining. They are encouraged from the outset to assume initiative in improving their situation and in placing less dependence upon hospital support. From the beginning, the entire expense is borne by the patient. He actively participates in all planning and all arrangements must meet with his approval. This program is similar to foster home care in that the initial environmental situation is carefully selected and the patient is also, during the initial phase, given a great deal of support and supervision by the hospital staff.

The impact of our program upon the community has been interesting. We now have more job resources than we have patients to utilize them. Individuals in the community are now calling the hospital to inform us that they have an opportunity available for a patient. *Not one employer who has undertaken the responsibility of helping a patient has become discouraged and withdrawn from the program despite, at times, even embarrassing situations.* Nonpsychotic individuals have caused more difficulty to us and to the community in effecting an adjustment than have psychotics. Many of the former have resorted to alcohol, changed jobs abruptly, and caused disturbances at places of business and at foster homes; one has even been sent to prison. Both employers and the training officer now ask the ward surgeons for the referral of patients in the psychotic categories, especially those in the schizophrenic group.

SUMMARY

1. The responsibility of a mental hospital does not end with sending the patient out on trial visit. The hospital also has, or should have, some responsibility for finding a proper vocational placement and supervising that placement, when the family are unable or unwilling to do so.

2. In assuming that responsibility, the Veterans Hospital at Roanoke, Va., maintains constant contact with persons in the community who are willing to find placements for selected trial-visit patients.

3. Methods of selecting patients, and of preparing them and the employer, are described.

4. A typical case of successful placement is detailed.

5. In the past 3 years, we have worked with 68 patients in this program. Nine of these are considered failures, and 49 must be definitely classed as successful placements. The other 10 patients are still under supervision, and for the most part are adjusting well.

6. Schizophrenics seem to have less difficulty in making an adjustment than individuals with other psychiatric disabilities.

7. This program, carried by one employee, has resulted not only in the community readjustment of a number of individuals with severe chronic psychiatric disabilities but also in the saving of thousands of dollars to the government.

OBSERVATIONS ON CULTURAL PSYCHIATRY DURING A WORLD TOUR OF MENTAL HOSPITALS¹

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The present status of cultural psychiatry may be likened to that of the science of botany in the days of Pliny the Elder. In his day people went into the woods, gathered leaves, and began to sort them. As a result, the old Roman botanist was able to describe about a thousand plants in his "Historia Naturalis." It was still a far cry from the systematic efforts of Linnaeus in the middle of the 18th century, who succeeded in classifying 67 orders of plants. Again, his endeavours were still crudely empirical by comparison to the systematization of the National Arboretum in Washington. Cultural psychiatry, like any other science, will have to go through a period of dependence on inductive methods, *i.e.*, the accumulation of large stocks of impressions, suggestions, and tentative conclusions leading to elastic working hypotheses, before reaching the stage of deductive reasoning from strictly verifiable generalizations. The latter task is especially difficult in the field of cultural psychiatry, which is very much like plotting a graph involving 2 indeterminate variables, since the evaluation of both the cultural and the psychiatric factors are still in *status nascendi*.

Modern air transportation enabled the writer to circumnavigate the globe and to take side-trips to points into the interior in the relatively short period of 6 months from mid-February to mid-August of 1951. It would have taken by steamer and railroad a period well over 3 years. Despite this time-saving advantage, I am painfully aware of the cursory and necessarily panoramic nature of the observations bearing on cultural psychiatry. I am all the more grateful to cooperative colleagues in the various mental hospitals and curators of anthropological museums for affording me a glimpse into subsurface functioning of socio-mental forces in the different cultures.

¹ Read at the 107th annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 7-11, 1951.

VARIETY OF MENTAL HOSPITALS REFLECTING ATTITUDE OF LOCAL CULTURE TOWARD PSYCHIATRY

Eire

Mental hospitals visited in the course of the world tour differed not only in equipment, methods of therapy employed, conditions of crowding, size and training of staff, but also in their general attitude toward mental illness and the mental patient. There is, for example, the sheltering intimate attitude in Eire's 22 mental hospitals. In addition to these institutions there is also boarding of patients in a "living-out" system. In the district mental hospital of Kilkenny I found the patients on a Sunday evening gathered about the fireplace and exchanging old yarns. Drs. Cassin and Grace and the chief clerk knew nearly all the 480 patients by their first names. The buildings have the gray drab appearance of our old county poorhouses but the attitude toward the patient is one of warm, kindly tolerance born of a feeling that we are all perhaps a "bit queer." About 50% of the patients are seniles. Modern physical methods of treatment are employed in this 98-year-old hospital and there is an active occupational therapy department. But the outstanding feature is the personal attitude facilitating the socialization of the patients.

Portugal

The mental hospital of Lisbon, "Júlio de Matos," presented a somewhat contrasting picture. This is a large cheery hospital reflecting the Mediterranean love of vivid color and profusion of flowers. Here one finds a strong emphasis on psychosurgery possibly because of the influence of the eminent neurologist Prof. Egas Moniz, who is regarded as a national hero. Otherwise the therapy is eclectic and is efficiently carried on under the directorship of Prof. Barahona Fernandes. He told me that there are only 2 psychoanalysts in Portugal. Dr. Oller of

Barcelona gave me his estimate of 26,000 physicians in Spain of whom about 500 are psychiatrists. There are hardly any psychoanalysts.

Morocco

The "Hospital Neuro-psychiatrique de Ber Rechid," 60 kilometres out of Casablanca, houses about 800 patients Moorish and European, some of whom look like characters from the "Foreign Legion" tales. This is the only organized mental hospital in a population of about 8 million. Twenty years old, it was formerly a malaria hospital. It is made up mainly of individual isolation rooms consisting for the most part of a bed and a stone toilet bowl. The improved patients linger in the courtyard awaiting the next meal. Twenty percent of the admissions are paretics. The director of the hospital, Dr. R. Poitrot, is struggling bravely with what is a sort of "pilot plant" in a much larger program required to meet the needs of the population.

Tunisia

A somewhat more progressive institution is the "Hospital Pour Les Maladies Mentales de La Manouba" in the Protectorate of Tunisia under the direction of Dr. Pierre Mareschal. He and one other physician, a native Tunisian, constitute the medical staff of a hospital housing 420 patients. Modern methods of physical therapy such as electric shock and insulin are used. Fifteen percent of the hospital population are paretics. Recurrent fever is used, the malaria strains being too mixed and also because of the prevalence of liver disease. Generally there is a feeling of divided responsibility between the colonial administration and the native government dealing with the multiplying problems in a continent just beginning to stir into a social awakening. I was told that in Algeria there are some more advanced mental hospitals, that part of North Africa being more closely integrated with France.

Republic of Israel

A cultural bridge between the Moslem and Western worlds is the new-born Republic of Israel. The mental hospital facilities are also inadequate for the rapidly growing largely

immigrant population. From some countries the emigration takes on the form of mass evacuation involving the removal of inmates of mental hospitals to the new land. There are altogether about 500 beds available in the country and the need has been estimated to be about 3,000. Refugee psychiatrists in private practice including a fair number of psychoanalysts somewhat relieve the situation. The old Ezraith Noshim Mental Hospital in Jerusalem under the direction of Prof. Lippman Halpern with a capacity of 125 beds is quite crowded but is neat and efficient. It makes up for limited space and equipment by a humanitarian attitude toward the patient. The country as a whole presents a mosaic of many cultures threatening at times to become a "crazy quilt." However, if sanity is to be defined as the ability to live with as yet unsolved problems then there seems to be a good deal of it in evidence in this complex old-new land.

India and Kashmir

The far larger sector of mankind, India, is also sorely beset with a growing crop of problems. There is a shortage of nearly everything except congested humanity of whom there is almost 450 millions. There is a pressing need of millions of teachers, perhaps as many physicians. Psychiatrists therefore come in the category of luxury. Dr. R. S. Lal of the Agra Mental Hospital told me that there are 17 psychiatric institutions in the country with some 50 psychiatrists. There is also a small psychoanalytical society publishing a journal under the leadership of Dr. Bose, an old disciple of Freud. Actually however, psychiatry has been practiced largely as a form of medical jurisprudence, being in the main concerned with questions of civil competence and certification. Dr. K. R. Masani, a psychiatrist of Bombay and a leader in the country's mental hygiene movement, informed me that the Indian Institute of Psychiatry and Mental Hygiene, founded in 1943, has been significantly expanded to form the India Institute of Mental Health and Human Relations, apparently realizing that the cultural and psychiatric problems of this complex country are deeply interrelated.

Accompanied by this hospitable colleague

I visited the large mental hospital at Thana, about 20 miles from Bombay, and not very far from the larger mental hospital at Poonah. The Thana institution is much overcrowded, housing close to 800 patients with a bed capacity for only half that many. However, sleeping on sidewalks is a very common sight in Indian cities especially since the refugee influx from Pakistan, and one has to pick his steps very warily walking about through the streets of present-day Bombay. The above hospital occupies a middle position between the very advanced psychiatric hospital of Ranchi in northeastern India with a reception center at the observation ward of Bhowanipore in Calcutta, on one hand, and the small institutions in the interior on the other. These latter are hardly more than civilian detention camps where mental defectives and deaf mutes are housed along with violent patients mostly certified by so-called "medical jurists" and magistrates. Treatment, if any, varies from modern convulsive therapies to Yogi exercises and Ayurvedic medicine of which there is a large college at the University of Benares. Yet I was told in the mental hospital of the colorful city of Jaipur that they average about 10% of spontaneous recoveries.

Tucked away in the far northwest of India is Srinagar, the capital of much-disputed Kashmir. There I found a very impressive general state hospital of many wings with Dr. Jacoby, formerly of Berlin, as physician in chief. It has over 300 beds and a modern surgical amphitheatre. However, the "lunatic asylum" housing some 50 patients is 4 miles away and characteristically near the jail. This was not altogether surprising for I had been told by a member of the visiting United Nations Commission that in some parts of Kashmir (probably Ladakh, near Tibet) the treatment for a man bitten by a rabid dog is to get the patient drunk and tie him to a 25-pound chair. Far away to the south near the storied Taj Mahal is the Agra Mental Hospital housing about 650 patients. I have been impressed by their unique occupational therapy methods. They are utilizing the Ghandi movement of the national spinning wheel. Along with the usual cooking and weaving activities the patients are making a sort of homespun air-conditioning screen that is very

helpful in the terrific heat of pre-Monsoon India. The life in the courtyards of most of the mental hospitals of the country goes on naturally almost as in the squares of the more than half a million villages of India.

Burma

In nearby Rangoon, Burma, at the Tadagale Mental Hospital a part of the occupational therapy program consists in allowing the quieter women patients to take care of children born in the hospital. This institution of 300 patients, of whom 90 are women, appears rather lonely among a veritable forest of pagodas (perhaps some 50,000) clustered about the chief Buddhist shrine of Shwedagon. Here as in India psychiatry is regarded mainly as a branch of medical jurisprudence, which is modelled after the India Lunacy Act. Attempts are now made to introduce more modern methods of treatment.

Thailand (Siam)

More progressive is the attitude toward psychiatry in Thailand (Siam). Of the 5 mental hospitals in that country the one at Dhonbury near Bangkok is the largest, consisting of some 17 buildings and housing over 1,000 patients with a staff of 9 physicians, 30 nurses, and 130 attendants presided over by Dr. Phon Sangsingkeo and his assistant Dr. A. B. Suwana, who have studied at the Colorado Psychopathic Hospital in Denver. The grounds are very spacious and landscaped and the spirit is characteristic of the whole country's eagerness to adopt western scientific methods as evidenced by the nearby Pasteur Institute, for the extraction and uses of snake venom.

Singapore

The closest the writer came to a Chinese mental hospital was in Singapore, a city of over 75% Chinese. The latter have indeed spread far and wide beyond China to the outermost corners of Oceania. The hospital is very large and houses about 1,200 patients with a polyglot assortment. The Chinese patients are proportionate to their numbers in the general population. There are also Hindus and Malays and a medley of Europeans rep-

resented in this "crossroads of the world." There are 5 physicians headed by Dr. James Browne of England. I was taken around by Dr. M. F. Yapp. There are quite a few toxic psychoses due in part to drug addictions and also to dental caries induced, strangely enough, by a widespread practice of gold capping of teeth as an exhibition of wealth.

Bali

Further afield in southeast Asia lies Bali, an island not only in the geographic but also in the cultural sense. The culture is many-layered in its stratification. Deep in the interior I was told psychotics are sometimes regarded as inspired. The little mental hospital in Bangli near Den Passar houses 86 male patients and 52 females and can hardly be commensurate with the needs of a population of about 1½ million. Of great interest to me was the occupational therapy project exhibiting drawings and paintings by patients of primitive treatment of the insane. One of these depicted a gigantic man astride a river who was holding the patient by his feet and dunking his head in the stream. Whether some such methods are still practiced in the deep interior is subject to exploration.

Australia

Across the equator in the Antipodes, mental hospitals began to assume the more familiar Anglo-American pattern. Dr. Grey Ewan, director of the Division of Mental Hygiene of New South Wales, speaks with much pride of the hospitals for the criminally insane. I ventured the explanation that public opinion in Australia is especially sensitive to the plight of the convict because of the cruelties perpetrated on the early convict settlers in Port Arthur, Tasmania, and other parts of the land. He readily agreed. I was also informed by him that there are about 200 psychiatrists on the island continent and a rare psychoanalyst in the larger cities. However, psychiatric nurses are said to be well trained and after general certification are given intensive preparation in mental hospitals. Dr. Fraser, superintendent of the Gladesville Mental Hospital of Sydney hous-

ing about 1,500 patients, is deeply interested in occupational therapy. Characteristic of the social pioneering of the land is the socialization therapy carried on at the adjacent public playground on the Parramatta River where teams of the general public and those of the improved patients join in competitive games.

New Zealand

Across the Tasman Sea lies New Zealand where the psychiatric institutions reflect much of the country's social-mindedness. Presiding over the large Auckland Mental Hospital at Avondale is the very hospitable Dr. Henry M. Buchanan, originally from Scotland. The racial kaleidoscope of Oceania is represented in the patient population. There are the European stocks, the native Maoris, Raratongans, Fijians, Nuie Islanders, Samoans, and Micronesians. The assistant superintendent, Dr. G. Blake Palmer, carries on intensive anthropological studies among the Maoris. Their persistent belief in "Mana," an animistic power transmitted through ancestral spirits, is a potent psychological factor in the causation of disease, especially in its malevolent form of "Makutu." He writes in a recent essay that even today the capacity of the Maori "to die when he feels that he is suffering from some fatal but possibly non-existing ailment is still very great." In his presence I saw a patient suffering from "ideas of reference," whenever she had an exacerbating osteomyelitis. The patient's idea of persecution by members of her family may have been partly delusional but there was also the possibility of an actual "frame-up." Differential diagnosis presented the very difficult problem of disentangling possible realistic elements of fear, also toxic elements due to physical illness, and cultural components due to the belief in the transmission of "Makutu." However, one must not lose sight of the significant contribution of the Maoris to the progress in New Zealand where they are generally well integrated. A full-blooded Maori, Dr. Henry Bennett is staff psychiatrist at the Sea Cliff Mental Hospital at Dunedin on the South Island, and Sir Peter Buck, present director of the Bishop Museum at Honolulu, is the son of a Maori mother.

Fiji Islands

On the unmarked boundary between Melanesia and Polynesia lies the scattered group of 322 islands comprising Fiji covering an area of 100,000 miles of Oceania. The quarter million people living there are largely composed of the Melanesian Fijians—tall, dark, and fuzzy headed—and a growing number of the descendants of immigrants from India. The Fiji Mental Hospital, 2 miles from Suva, the capital, mirrors this curious mixture. It houses about 100 patients. Dr. Kingsley R. Steenson, originally from Oamaru, South Island, New Zealand, is in charge. In attendance is Mr. Mohash Prasad of Hindu stock. He was trained in the Fiji Central Medical School, which provides native medical practitioners who are supposed to work under fully qualified medical officers. The warders of the hospitals are again Samoans—a more or less "neutral" element between the competing Fijians and Hindus.

Hawaii Islands

Back to American territory one is pardonedly proud of the institutional achievement in psychiatry represented by the territorial hospital near Honolulu, a city oft referred to as the "crossroads of the Pacific." Dr. Marcus Guensburg, the medical director, guided the writer through the magnificent new buildings in the dramatic setting of the mountains of Oahu. The hospital is equipped with departments of clinical psychology, electroencephalography, dietetics, and vocational rehabilitation. Electroconvulsive therapy and its latest modifications, brief stimulus therapy, insulin (coma and subcoma), group psychotherapy, narcotherapy, frontal leucotomy, and other forms of psychosurgery are being employed. Intensive occupational and recreational programs are actively promoted. The building is modern in every detail; color schemes having been employed as a tranquilizing factor. Screens and fine grille work have taken the place of iron bars. Swimming pools and play courts may help to explain the rapid increase of voluntary admissions. More significant is the determined effort to eliminate the frightening terminology of the "lunatic asylum" days. In

the words of a recent report of the Department of institutions of the Territory of Hawaii¹, the territorial hospital is the result of "the determination to remove the remaining vestiges of a custodial institution and to convert it into an active and effective treatment center."

RELATIVE INCIDENCE OF TYPES OF MENTAL ILLNESS IN VARIOUS CULTURAL REGIONS

The gathering of facts about incidence of types of mental illness in different cultures is by no means a simple procedure. Statistical data on the subject are scarce, spotty, or not at all available. The writer made strenuous attempts to obtain such data and found that even on the highest level of international medical organization statistical enterprises are at best only projected. Indefiniteness of diagnostic criteria may be one of the causes. In a number of lands mental hospital admissions are catalogued mainly by the degree of the patient's violence, *i.e.*, the measure of disturbance they cause to the community. In some cases the difficulty of obtaining psychiatric data is due to the unwillingness of certain governments to publicize unflattering statistical pictures showing comparative retardation in the scale of civilization. The presentation of any new information in this *terra incognita*, albeit fragmentary, would therefore help to fill a long-felt need.

This traveller was impressed by the relatively larger incidence of manic-depressives than schizophrenic types of psychoses in the lands of the Mediterranean basin. Dr. Poitrot of Morocco, Dr. Mareschal of Tunisia, Prof. Halpern of Jerusalem, and Prof. Fernandes of Lisbon all conveyed to me this conviction. Prof. Fernandes seemed especially emphatic in his opinion because of his experiences also in the hospitals of northern Europe, where he felt the manic-depressive reactions to be comparatively less frequent.² I found, on the

¹ More recent travels (summer, 1951) in northwestern Europe afforded the author an opportunity to confer with Dr. H. Frøshaug of Dikemark Hospital, Norway; Dr. Soanes of Beckomberga Hospital, Sweden; Dr. M. Ekblad of the Karolinska Institute Psychiatric Hospital, Stockholm; Dr. Parland of the Nikkilä Hospital, Finland; Dr. G. Magnusson of St. Hans Hospital, Roskilde, Denmark; Dr. H. J. F. Rademakers of the Gheel Colony,

other hand, in the district mental hospital of Kilkenny, Ireland, a relative preponderance of manic-depressives. According to the figures presented to me by Dr. P. Grace of that hospital the distribution is as follows: 50% seniles, 20% manic-depressives, 10% schizophrenics, and 20% other types. Temperamentally the population surrounding that hospital would seem to be closer to the Mediterranean peoples. I spoke all along of the *relative* incidence, because the actual number of patients in a mental hospital would have the general tendency to show a more constant preponderance of schizophrenias, in view of the greater chronicity of that disease.

The picture changes noticeably when attention is shifted to the vast cultural region of southeastern Asia, more specifically in the countries where Hinduism and Buddhism prevail. Dr. R. S. Lal stated that in his hospital at Agra there is a very definite preponderance of schizophrenics over manic-depressives, and it was his impression that the same was true of other hospitals in India. Along with this there is also a great deal of extreme food "particularism," which may be merely ritualistic or suggestive of schizophrenic reactions. As a result of this food discrimination there is also a fairly large incidence of deficiency disease depressions such as beri beri, pellagra, etc. The "Saadhu" who is withdrawn from life and is venerated as a saint is not too infrequently at least a schizoid personality.

The relatively large number of postpartum psychoses in India, Kashmir, and neighboring lands may also be interpreted as a leaning toward the schizophrenic side, because of its greater incidence among schizoid and narcissistic types of personalities. Now while this mental disorder can happen at any period of the childbearing age, one wonders whether frequent marriages of early adolescents in some sections of southeastern Asia is not an important contributing factor. The number of puerperal psychoses in Thailand (Siam)

Belgium; and other staff members of those institutions. They were unanimous in confirming the impression of the large predominance of schizophrenic reactions among patients of north-European mental hospitals and, furthermore, indicated that the manic reactions in those lands were seldom pure, there being usually a strong admixture of catatonic features.

is much less than in India and in the former country early postpuberty marriages are more rare.

Dr. Eric Berne in his traveller's account of "Some Oriental Mental Hospitals" (2) reports that in the government mental hospital at Kilpauk, a suburb of Madras, India, with a population of 1,750 patients the type distribution is about 50% schizophrenics and 30% manic-depressives. In the Tadagale Mental Hospital at Rangoon, Burma, Dr. Ba Thaung, the medical director, is under the impression that there are twice as many schizophrenics as manic-depressives. In the large mental hospital of Dhonbury near Bangkok, Siam, Dr. Suvanna reports as high a figure as 70% schizophrenics. Dr. Berne reports that in the mental hospital of Hong Kong "most of the patients were schizophrenics." Dr. Jose Fernandez of the National Psychopathic Hospital near Manila reports (oral communication) 39% schizophrenics and 26% manic depressives; and the demographic situation in the Philippines is one of great complexity. Finally at the other corner of the southeastern Asia triangle in Japan, Prof. Konuma of the medical school of Hiroshima claims an 8 to 1 ratio in favor of the schizophrenics.

These are the facts, but by no means *all* the facts and therefore one would hesitate before making hasty generalizations. Yet one may pose the legitimate question: whether the type of temperament often prevalent in Mediterranean lands with its love of life and its greater emotional lability facilitates the manic-depressive reaction at least as a precipitating factor. On the other hand one would want to know in what way does the cultural pattern of passivity, nonresistance, and the ideal of retirement from the temporal concerns of life, so characteristic of the lands of Hinduism and Buddhism, facilitate the precipitation of the schizophrenic reactions and possibly also be a factor in converting episodic into more malignant forms of the disease. Dr. K. N. Massani of Bombay, who had extensive experience also in the mental hospitals of London, told me that he was greatly impressed on his return from England to his native land, by the comparative rarity of violent behavior among patients in the mental hospitals of India.

The problem became more complex and also more challenging upon my arrival in Fiji. Originally it had been a Melanesian domain. However, during the end of the last century immigrant labor was imported from India to work in the sugar industry. By 1946 the Hindus began to outstrip the Fijians in population with resulting interracial tensions. The 2 main elements of the population differ radically in many ways. The Hindus increase more rapidly perhaps because of the earlier

TABLE I
DISTRIBUTION BY RACE, SEX, AND TYPE OF MENTAL
ILLNESS IN THE SUVA MENTAL HOSPITAL
(FIJI)—1948 REPORT

Racial and Sex Distribution			
	Male	Female	Total
European	5	4	9
Fijian	11	10	21
Indian	34	20	54
Others	8	1	9
	—	—	—
	58	35	93

Distribution by Type of Disease		
(Total Admissions)		
	No. of cases	No. of deaths
1. Manic-depressive insanity	92	6
2. Paranoia and paranoid states	12	..
3. Schizophrenia	4	..
4. Reactive and toxic insanities
5. Epilepsy	6	..
6. Mental deficiency	9	..
7. Hysteria	3	..
	—	—
	126	6

marrying of their women and the greater immunity to tuberculosis, having had longer contact with the European races than the Fijians. Yaws and lues affect differently the 2 races. But from the psychiatric point of view the most interesting phenomenon is the distribution of the types of mental disease. *Mirabile dictu*, in this far-away land of the South Pacific statistical information was available in a governmentally authenticated documentary form on the racial distribution and types of mental illness. I am grateful to Dr. K. R. Steenson for the most recent (1948) report of the medical department of the Legislative Council of Fiji(3). It presents the data shown in Table I.

Another recent report on the "Land and People of Fiji" by public relations officer, L. G. Usher, states that, of the total population of about a quarter million, 47% (133,000) are Indian and 44% (127,000) are Fijians. There are also 6,000 Europeans, 6,700 part Europeans (together 41%), 7,500 Rotumans and other Pacific Islanders, and 3,000 Chinese. The 1946 census states that 83% of the Indians are Hindus and only 14% Moslems, nearly 2% Christians, and about 1% Sikhs. Thus the great majority of the Indians belong to the cults of Hinduism of their mother land. Now I have been definitely informed that in the large predominance of manic-depressives in the Fiji Mental Hospital (as shown by the accompanying table) the Hindus are represented in accordance with the racial percentage in the total admissions to the hospital. This is in sharp contradistinction to the general reports emanating from India proper. In the interpretation of this odd phenomenon one wonders how much weight is to be attached to change of diet, climate, religio-cultural environment, or even to the factor of selectivity of immigration.

However we are dealing here with a very strange mosaic of cultures. The impact of Wesleyan Methodism on very recent cannibalism is much in evidence. The last of the missionaries, I was told, was eaten in 1867, and the baptismal font in the Methodist Church at Mbau, the old royal Fiji capital, was originally a sacrificial altar for cannibalistic rites before the days of the conversion of King Cochabau. When one adds to all this the position of Fiji Island on the border of Melanesia and Polynesia, and when one also throws into the melting pot the ancient cultures of Brahminism and Mogul India with a sprinkling of Chinese and superimposition of Anglo-Saxon administration, one is faced with a bewildering confusion, which is saved from cultural chaos by the persistence of the common denominators of the perpetually human.

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THE PREDICTION OF JUVENILE DELINQUENCY USING THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY¹

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There is a great need for increased knowledge of the earlier symptoms of criminal and other maladjustive behavior. For example, many aspects of the mental hygiene movement rest upon the assumption that therapeutic work with children will decrease the likelihood of their later delinquency or mental illness. There is very little, if any, acceptable experimental evidence to support this assumption. Even if we did know that earlier psychotherapeutic efforts decreased the later incidence of maladjustment, we have no reliable evidence for testing the validity of the presently available survey methods for identifying subgroups of children more likely to have trouble. We must depend upon the crude and unsatisfactory fact that a person already in trouble is more likely than others to have additional trouble, and therefore either blindly do our preventive work on whole populations or else wait for children to become deviant in behavior and then offer treatment.

The majority of published studies undertaken to discover the personality characteristics of young people who later develop behavioral disorders have been based upon data collected after the individuals became deviant. It is usually the established fact of maladjustment, bringing the individual to the attention of agencies, that initiates a systematic attempt to relate his background to his present status. A considerable portion of our meagre knowledge regarding the earlier symptoms of maladjustment is, therefore, derived from a reconstruction of the individual's developmental past. Although valuable knowledge has been obtained about the premonitory symptoms of coming person-

ality disorders through such reconstruction, the method involves many hazards. The reliability of the anamnestic data is dependent upon the cooperativeness and credibility of informants as well as upon the accuracy of official public records. But even if reliance could be placed upon the information contained in the case records, such information is seldom cast into objective and standardized categories.

These difficulties are particularly important when one attempts to review the past personality of the deviate himself. Having become delinquent, he is a resultant of conscious and unconscious trends that he cannot be trusted to recall; nor can we safely infer such historical personality data. Control group methods having a similar design are also suspect since the collection of information is inevitably colored by the knowledge on the part of informants and investigator that the present status of the experimental or control case needs or does not need explanatory findings. The memory of even the most objective among us is not unlikely to be more free with colorful adverse incidents about a boy's life if associations are prompted by the knowledge that the boy has persistently stolen automobiles.

Considering these and other difficulties, it seemed desirable to try a longitudinal approach by collecting large sample data on children most of whom had not as yet manifested severe personality disorders. The signal success achieved by the longitudinal studies of Freeman and Flory, Terman, Terman and Oden, and the Gluecks, amongst others, emphasized the probable value of further work with longitudinal designs. The particular feature of the proposed study would be the use of objective personality tests consonant with routine practicable application in schools. Certainly such devices should be tried. If objective personality tests do yield valid predictions, then we have as inexpensive and administratively simple a screening

¹ Read in the Section on Legal Aspects of Psychiatry at the 107th annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 7-11, 1951.

² Department of Psychiatry and Neurology, University of Minnesota.

³ Department of Sociology, University of Minnesota.

system as one could desire. In view of such considerations, a study was designed to accumulate test profiles and other data from a large group of early adolescents as a foundation for future correlation with data collected on the persons as they grow older. We are presenting the first of our findings in this paper.

The choice of an instrument was a prime problem. The Minnesota Multiphasic Personality Inventory (MMPI) was chosen because the work of Capwell and Monachesi, amongst others, strongly suggested that MMPI profiles of juvenile delinquents differed significantly from those of nondelinquents. Hathaway, Hastings, and Capwell also found that profiles from this test yielded a usefully valid prediction of the behavior of reform school girls after they were free from parole. Further, clinical evidence accumulated in the psychopathic unit of the University of Minnesota Hospitals indicated that MMPI profiles of juveniles were, to some degree, valid for the assessment of psychotic and neurotic states. Against use of the MMPI was the fact that it was developed on adults and has had its chief application in that field. The wording of some of the items is also inappropriate, and experimental findings have indicated that item response frequencies are often correlated with age thus making questionable the applicability of the adult norms to juveniles. Although we recognized the shortcomings of the MMPI, it was decided to adopt it as the survey instrument. In summary, this decision was based on the facts that the MMPI possessed a fairly well-established validity for adults; there existed strong indications of its probable validity for juveniles; it contained 550 items suitable for item analysis; and finally, it is very widely used and new scales for it are continually under development.

The next problem involved the choice of a juvenile group for the initial survey. The advantages in favor of the selection of a single chronological age level were outweighed by administrative difficulties. Instead, it was decided that all of the children of a given school grade level should be chosen for examination. The inappropriateness of some of the MMPI items for young children pointed to the desirability of selecting an

upper grade; yet the abrupt rise in the curve of the incidence of juvenile delinquency, beginning at approximately age 14, restricted us to a grade composed of comparatively younger children. We decided on the ninth grade. The population of the study was the public school ninth grade children of Minneapolis.

Out of a total ninth grade school registration of 4,572 pupils, the testing program provided 4,046 completed answer sheets. Two hundred and forty-one pupils were lost by the refusal of one school to cooperate, and other pupils were lost by absence from school on the day tests were given, and by other incidental interferences. Many of these pupils were later tested, but some were inevitably lost. Juvenile delinquency, one of the categories of deviancy in which we are interested, was dramatically highlighted when two pupils, while answering test items, were summoned to the principal's office and thence down to the city juvenile court for examination. These two failed to complete the test. Needless to say, this loss of critical case material was keenly felt by the examiners who were in charge on that occasion.

Before the study was under way, we feared that many of the children might not be able to read the items accurately enough to make consistent responses to the MMPI. Further, we wondered how many of the children would understand the words and in general comprehend the import of the items so as to make their answers consistent. The degree to which our fears were unfounded is indicated by the F scores, a group of statements designed to aid in the detection of a person who does not cooperate well or does not know what he is doing. Only about 4% of all records seemed to be of doubtful validity according to this criterion. Many of these doubtful profiles were in the borderline range and will be useful. In summary, it appears that, under the conditions that prevailed in this testing program, high school children in the ninth grade were found fairly cooperative and made reasonably competent responses to the MMPI even though its original design was not influenced by any expectation that it would be administered to younger people.

There are a number of items in the test that relate to sex and physiology. There were

doubts among the school teachers relative to these items. It was feared that the children would be disturbed or facetious or that parents would react unfavorably. Consequently, the testing program was carried out in one large school, and we waited for 2 months. Nothing untoward happened. We concluded that if we used the test with a simple and positive approach and if we treated the whole affair as routine, no trouble would ensue.

The first phase of our follow-up to estimate the predictive ability of the MMPI was begun in January, 1950, and ended July 1, 1950—almost exactly 2 years after the original testing. During this period the records of the Juvenile Court and the juvenile division (male and female) of the Minneapolis Police Department were examined to determine who among our ninth grades (now further along or out of school) had had contact with these agencies before or after being tested. We found a total of 597 of our subjects involved, 442 boys and 155 girls. Roughly one-half of each group were court cases.

These youngsters were first classified on the basis of the date of their contact with the court and police relative to the time they were tested. Then they were classified according to the severity of their delinquency. For this latter purpose 3 categories were used: (1) youngsters who had committed several serious offenses (burglary, larceny, auto theft, etc.), that is, had established an unmistakable delinquent pattern; (2) youngsters who had committed one serious offense as well as several minor offenses; and (3) youngsters whose contact with the law involved a minor offense (at least 2 traffic violations). The first 2 groups we considered to be clearly delinquent. (Of interest is the fact that our investigation has produced further evidence to substantiate what has been known for some time; namely, the nature of the offense does not play any major role in determining whether a child appears before the court.)

As a background for the particular figures, we shall review briefly some general MMPI findings. The MMPI can be scored for 9 scales that refer to 9 commonly observed clinical syndromes. Examples are such neurotic patterns as hypochondriasis, depression,

hysteria and psychasthenia; such psychotic patterns as schizophrenia, hypomania, and paranoia; and the behavior disorder syndrome psychopathic personality, asocial-amoral type. This last scale refers to a special group to whom we apply the term psychopathic deviate. In addition the MMPI may be scored for social introversion, for masculinity-femininity of interests, and for various scales like the F scale described above that are intended to indicate the validity of the responses given by the persons who take the tests. In addition to these scales, which were immediately machine scored for all children, there are other measures that have been or are being developed for scoring on the same test items. Although the present report is not dependent on any of these newer scales, there is very high probability that some will be found valuable.

As a group, the high school children were most likely to obtain high scores on scales related to hypomania and psychopathic deviation. The scale derived from schizophrenic patients also had a tendency to be elevated. Scales indicating neurotic involvement were, by contrast, more infrequently found as a dominant characteristic of the test profiles. In general, the so-called clinical scales of the MMPI indicated that, so far as one may contrast the high school children to adults, the children tend to have patterns that would be akin to psychosis and behavior disorder rather than to neurosis. Those who work with high school children will not, of course, be surprised that these should appear like hypomanics when contrasted with mature adults.

There were several rather marked sex differences. The girls were more likely to be socially introverted, masculine, and paranoid in contrast to the boys who were more likely to be depressive, psychasthenic, and schizoid. These findings are roughly analogous to many other reports in the literature relative to the average characteristics of adolescent children. They must, in the present instance, be interpreted cautiously because of the obvious invalidities involved in the direct application of clinical scales derived on adults to a high school population. Further follow-up data will, of course, give us a better un-

derstanding of the meaning of these differences.

The following preliminary findings are based upon the simplest of comparisons of test results to the delinquency rate. Our experience with similar research shows that these first findings can be bettered materially by later study of the differential signs. It should also be kept in mind that the delinquency rates we are reporting are the occurrences within the first 2 years and that undoubtedly the rates per thousand will rise as subsequent surveys discover more and more of the population becoming delinquent.

For this report we shall combine all 3 levels of delinquency because the numbers of persons involved will be larger. We have separately analyzed the severe cases, but the trends do not seem greatly different; and in this preliminary study it seems justifiable to consider all levels together. It should be kept in mind in evaluating what we are saying that the least among the offenses considered delinquent would be 2 traffic violations or what was considered an equal amount of police contact; the great majority of the children were involved in more serious difficulty than this lowest level.

Among 1,834 boys on whom a valid test profile was available, 382 were found at one of the 3 levels of delinquency by the end of 2 years. The 382 boys represented a delinquency rate of 201 per thousand. This means that 1 in every 5 boys had achieved a police record by the time the follow-up was made. Some of these had been in trouble before the time of testing, but here again the overall results are similar to those that would be obtained if the study were restricted to those who were first registered subsequent to the testing survey.

Among 1,945 valid test profiles from girls, 140 girls were found registered in police files. This represents a rate of only 72 per thousand, about a third of the rate among boys. Although there are some rather certain sex difference trends developing in the test data, the present report will deal chiefly with the delinquent boys.

Illustrative of the preliminary findings, one may consider those boys in the original study who obtained their highest deviant scores on the clinical scales of the MMPI

that are called Pd and Ma, the psychopathic deviate and hypomanic syndromes. Marked deviations of these 2 scales together occurred in about 7% of the male cases. Among this 7% of cases, the follow-up discovered a delinquency rate of 421 per thousand. This was about twice the rate observed for the whole group.

By contrast, one can find 3 patterns with relatively low delinquency rates. These profiles were those with no abnormal elevations, those with an elevation of the depression scale, and those with an elevation of the masculine-femininity scale. The latter would indicate those boys with relatively feminine interests. Profiles making up one of these 3 types constituted somewhat over 12% of the whole sample. Among these, however, the delinquency rate was only 100 per thousand. This was less than half the general delinquency rate and less than one-fourth the rate observed among the boys with psychopathic and hypomanic type profiles.

These findings can be put in another way. A first study of the data shows that roughly 20% of all of the boys could have been classified as belonging to either a high delinquency rate group or a low delinquency rate group. The group with the higher probability of delinquency would have a rate 4 times that of the other group. It should be kept in mind that this subdivision of the profiles can be done on a purely clerical basis, is entirely objective, and is, so far as we know, subject to application to a school system in a perfectly routine manner.

The contrasting rates just given are the most striking among the various preliminary figures available. There are, however, a number of other trends that are entirely reliable statistically. Some of these trends would probably be predicted by other professional workers in the field of juvenile delinquency. In general terms, it appears that children who obtain MMPI profiles like those of patients who are neurotically depressed, hypochondriacal, or psychasthenic, are much less likely to come into contact with police authority than are children whose profiles are like the ones from patients with psychotic or psychopathic clinical problems. Of course the best probability against trouble

for an adolescent is to have a profile with no deviant MMPI test score. Parenthetically, there appears to be one exception to this rule in that, among 56 girls whose profiles showed a pattern like that of adult hysterics, no single girl was found to have been in trouble involving the police.

The general findings to date raise several interesting questions that will have to be approached in later follow-up study. It seems likely to us that there may later be a subdivision among those boys who become delinquent having hypomanic characteristics in contrast to those having psychopathic deviate characteristics. It is possible that the former type of profile will not predict adult crime, whereas the latter may indicate more persistent trouble leading to later criminal activity.

The general findings are consistent with data reported by Hathaway, Hastings, and Capwell in a study of the postinstitutional careers of delinquent girls relative to MMPI tests taken while the girls were in the reform school. It was found that girls who later made poor social adjustment, with continued infractions against society, could be usefully

distinguished from other reform school girls on the basis of the dominance of the two MMPI scales, psychopathic deviate and hypomania. Although this latter study did not include many profiles having neurotic patterns, the trend was unmistakably similar to the present one in that the few girls who obtained generalized neurotic type profiles seemed to make better later social adjustments at least as measured by the relative lack of contact with social agencies in their careers.

In summary, the data available seem to make possible an easily administered and basic research design by which mental hygiene and other programs aiming to prevent delinquency may be evaluated objectively. Furthermore, it would seem that the findings make possible the selection of special subgroups of children in the public schools who have a high or low delinquency probability according to a desired function in a social agency. These and other possibilities appear to us to repay amply the research effort and to indicate a path that can be followed toward more scientifically justifiable preventive programs.

COMMENT

GOBBLEDYGOOK IN PSYCHIATRIC WRITING

The Germans have a proverb that, translated, says: "He who builds close to the road has many masters." Psychiatrists, in the past few decades, have come out of their hiding places where they were sequestered together with their patients. We are building near the road and our structures are within the view of all passers-by. Consequently, we have acquired many masters and critics. We are criticized especially for the manner in which we display our edifices. We are often accused of obstructing the visibility of the interior with dark curtains of obscuring language. A prominent physician—to quote but one of many examples—wrote some time ago: "I have a very definite feeling that the psychiatrist and psychologist have contributed somewhat to the attitude of suspicion, or skepticism. The psychiatrist, above all other people with whom I have come into close contact, has a penchant for obfuscating his thought with a most perplexing, and I feel unnecessarily complicated, verbiage."

It is quite true that every science must epitomize its concepts. New terms are added constantly to the technical vocabulary, and a steady flow of revised editions keeps the specialized dictionaries and glossaries from becoming obsolete. Chemical, geological, or medical terms that must have sounded like neologisms at the time of their introduction have come to serve as useful references among the professionals, and sometimes even among the laity. The word *schizophrenic* must have seemed strange at first hearing; it has since then assumed a ring of familiarity and is taken so much for granted that some of the would-be cognoscenti abbreviate it playfully to *schiz*, pronounced to rhyme with splits.

Obviously, the criticism is not directed against the inevitable coining of appropriate words. It should also be conceded that precise definitions of strictly circumscribed terms may at times require rather cumbersome formulations. One surely has a right to

be baffled when reading in a classical work on economics that "the value of D at the point of the aggregate demand function, where it is intersected by the aggregate supply function, will be called the *effective demand*"; yet so excellent a stylist as John Maynard Keynes could find no clearer mode of expressing one of the major premises of his theory that has had a profound influence on Anglo-American ideas about economics.

New words and concise delineations cannot be avoided and are often indispensable. But involved, long-winded, redundant, tautological, "obfuscating" language, to which the name gobbledegook has been applied, can, and should, be avoided. In analyzing some of the glaring transgressions, it is not always easy to distinguish between literary depositions of muddled thinkers and clumsy phrasing by clear thinkers.

A few years ago, *The New Yorker* picked up a passage from an article in a psychiatric journal. The attitudes and manners shown by the British in tea drinking, eating, smoking, and general behavior suggested to the author that "it is possible to detect in the English, taken as a nation, the cultivation of oral sucking impulses and the inhibition of aggression of a more direct and brutal type, from biting onwards. Given certain circumstances, these repressions are lifted, and the super-ego is able to tolerate the exercise of the corresponding functions." The amused editor asked: "One lump or two lumps, Doctor?"

Here is a passage—a sentence longer even than the yawn it may evoke—taken from a book that has had a wide circulation:

If the restitution required of the individual necessitates a very strong sense of constructive omnipotence—as, for instance, that he shall make complete restitution towards both parents and towards his brothers and sisters, etc., and, by displacement, towards other objects and even the entire world—then, whether he will do great things in life and whether the development of his ego and of his sexual life will be successful, or whether he will fall a victim to severe inhibitions, will partly depend

upon the strength of his ego and the degree of his adaptation to reality which regulates those imaginary requirements, and partly upon whether the tasks laid upon him are too exacting and the discrepancy between his destructive and constructive omnipotence exceeds a certain limit.

The following is a sentence contained in a statement on basic concepts in child psychiatry, circulated by the Group for the Advancement of Psychiatry among psychiatrists and lay groups: "The benign impact of a predictable reality on the maturing organism leads to the structuralization of the initially undifferentiated discharge-movements."

A social agency referred an idiotic child to a mental hygiene clinic. In due time it received a lengthy report, from which the following bits are reproduced:

The strong presence of a murky blue in her paintings indicates marked anxiety in connection with close to intolerable pressure or stimulation towards social control generally. The presence of black further adds a note of dysphoria associated with the need to resort to a repressive defense because of a background of too high standards where motivation to adopt a controlled, adaptive pattern was attempted through fear-arousing or other painful means. The use of yellow in this configuration would appear to denote the resistive drive to remain at the primal infantile level of oral dependency, the goal of which—as indicated by her marked initial preference for purple—is to regain her lost omnipotence status. . . . Extreme body preoccupation with focus on genitalia was reflected in play with miniature life toy material, and was further exhibited in extremely seductive behavior seemingly patterned after her mother's role in the primal scene setting. . . . The presence of a strong symbolic equation between oral and genital orifices should be considered; her mutism may, in part at least, represent severe castration feelings, which to a large extent are part of a more general sense of deprivation.

The child was committed to a school for the feeble-minded.

We have quoted 4 examples taken (1) from an article in a psychiatric journal, (2) from a psychiatric textbook, (3) from a statement made by a group of psychiatrists, and (4) from a report sent out by a mental hygiene clinic.

It should be emphasized that the majority of psychiatrists write clearly and sensibly. But there is still too much gobbledegook and too much "excess ideological baggage," as Whitehorn called it in his Presidential Ad-

dress. The reasons for this are undoubtedly numerous and complex. A few points, however, suggest themselves immediately:

1. Some of us seem to fear simplicity lest it be mistaken for mediocrity.

2. There seems to be some apprehension that the public will not be impressed by clear and direct statements made in everyday language. After all, everybody can say things simply, and isn't the specialist under obligation to display his erudition for the sake of professional prestige?

3. The advent of the "deep" psychologies has instilled in some of us a dread of being branded as "superficial" if we do not couch our talk in some sort of professional jargon. This has led some to the pseudo-logical conclusion that a goodly portion of balderdash will assure one's reputation as an expert in "depth."

4. One-sided training in specialized techniques has caused some of us to overrate their value out of all proportion to the broad field of psychiatry. Limited experience has resulted in a limited form of expression, often compensated by garrulous repetitiveness. Douglas M. Kelley, in a recent publication in this JOURNAL, has brilliantly demonstrated the abuses of Rorschach interpretations through "generalities, multi-ordinal terms, superficial description, and temperament depictions that can apply to anybody." Similar criticism can be leveled at the practitioners of other restricted methods applied out of context with clinical and social "reality."

In the eleventh century, Abu Mohammed Kasim ibn Ali Hariri wrote this prayer:

We praise Thee, O God,
For whatever perspicuity of language
Thou hast taught us
And whatever eloquence Thou hast inspired us
with.
Grant us a language adorned with veracity,
And style supported by conclusiveness,
And accuracy that may exclude incorrectness."

It behooves all of us to remember the words of the Arabic poet and grammarian who, after almost a millennium, is still famous largely because of his vigorous campaign against gobbledegook.

L. K.

NEWS AND NOTES

DR. CLEMENTS FRY HONORED.—Dr. Clements C. Fry of Yale University was honored at a dinner on October 12 given by members of the staff of the Student Mental Hygiene Service, for his 25 years' work in that department. During that time more than 8,000 students with emotional problems have been aided, and at present about 10% of the student body is using the facilities of the service. It is said to be one of the most fully developed college mental health programs in the country.

DR. STOGDILL GOES TO BOARD OF EDUCATION, TORONTO.—Dr. Charles G. Stogdill has been appointed to fill a new post recently created, that of Director, Division of Mental Hygiene, of the Board of Education of the City of Toronto. Formerly, mental hygiene work in the public schools had been carried on by a division of the city public health department, but it was felt that the field was of sufficient importance and magnitude to warrant a full-time position within the Board of Education.

Dr. Stogdill goes to Toronto from Ottawa, where for a number of years he was Chief of the Division of Mental Hygiene in the Department of National Health and Welfare.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPEUTICS.—This Congress took place in Leiden, Holland, September 5-8. Professor E. A. D. E. Carp was president, and Dr. A. H. Fortanier, secretary. The theme of Congress was "The Affective Contact."

The meeting was attended by more than 250 psychiatrists from different countries, and it successfully united representatives of various psychotherapeutic schools. A special feature was that no official national delegations had been formed and that no official languages had been named.

The next International Congress for Psychotherapeutics will be held in Zurich, Switzerland, in 1954.

METROPOLITAN STATE HOSPITAL POST-GRADUATE SEMINAR.—The seventeenth post-

graduate seminar in neurology and psychiatry will be a review course in basic neurology and psychiatry, given at the Metropolitan State Hospital, Waltham, Mass. The course is given on Mondays, from October 1 through December 3, 1951, and from March 3 through May 5, 1952, from 2:00 to 8:30 p.m.

1951 LASKER AWARDS.—Among this year's Lasker Award winners, recently announced, were the organization of Alcoholics Anonymous for its assistance to more than 120,000 chronic drinkers, and Dr. William G. Lennox of Boston and Dr. Frederic A. Gibbs of Chicago for their research in epilepsy.

"TRAP HEADACHE."—Dr. John Bostock, research professor of medical psychology in the University of Queensland, Australia, in an article in the *Medical Journal of Australia* (Jan. 13, 1951), suggests the use of the term "trap headache" to cover headaches caused by a conflict situation from which there seems to be no escape, rather than by the usual conditions generally considered as physical or physiological. Such trap headaches, he finds, can always be favorably influenced by adequate psychotherapy.

SOUTHERN PSYCHIATRIC ASSOCIATION.—On December 10 and 11 the Association will meet at Pinehurst, North Carolina, with headquarters at the Carolina Inn. Among the speakers will be Dr. Leo H. Bartemeier, president of the American Psychiatric Association. Dr. Newdigate M. Owensby is secretary-treasurer of the Southern Psychiatric Association.

NATIONAL ASSOCIATION FOR MUSIC THERAPY.—The second annual convention of this Association was held November 9-11 in Chicago. Experts in the field of therapeutic music, together with representatives of 30 cooperating organizations, demonstrated and discussed experiences and research prob-

lems. Musical instruments, records, and other materials useful in programs of hospital music were on display.

The Association is located at 250 W. 57th St., New York 19.

NATIONAL INSTITUTE OF MENTAL HEALTH RESEARCH AWARDS.—Funds totaling \$782,761 for 58 basic and applied research studies in psychology, psychiatry, and other fields of mental hygiene have been awarded by the Public Health Service's National Institutes of Health. Of these 58 studies, 20 are new projects. Three of the new grants will support studies of mental health factors related to industrial living.

THE CLARKE HALL FELLOWSHIP.—The Clarke Hall Fellowship of London, England, states as its object "To commemorate and to assure the continuance of the work done by Sir William Clarke Hall by promoting (a) the development of the probation system of dealing with offenders and (b) the sympathetic treatment of young offenders and neglected children and young persons by the use of progressive methods in juvenile courts."

Nearly 20 years ago the Fellowship inaugurated the Clarke Hall Lectures; eleven of these have been given and most are available in print. The 1951 lecture was delivered by John Watson and is entitled, "The Juvenile Court, Today and Tomorrow." The lectures cover a wide variety of phases of the general subject. They are available from the Clarke Hall Fellowship, Tavistock House South, Tavistock Square, London, W. C. 1.

WORKSHOP IN CHILD STUDY AT TUCSON.—The Brandes School at Tucson, Arizona, sponsored in March 1951 its first annual workshop in child study. The workshops were initiated in order to bring together the leading educators and scientists in the Southwest, and to facilitate discussion of current problems by teachers and students. The Proceedings of this first workshop have been received. Dr. Mandel Sherman was one of the participants.

PRESBYTERIAN HOSPITAL LECTURE SERIES.—The Fourth Annual Parent Guidance Institute at Presbyterian Hospital, Philadelphia, took place during October, November, and December, 1951. Emotional problems of children were stressed. The lecturers included Dr. Baldwin L. Keyes, Dr. Edward A. Strecker, Dr. Lawson G. Lowrey, Dr. Helen P. Langner, Dr. M. A. Tarumianz, and Dr. Samuel B. Hadden.

DR. KALLMANN PRESIDENT AMERICAN SOCIETY OF HUMAN GENETICS.—Dr. Franz J. Kallmann, associate research scientist in charge of the department of medical genetics of the New York State Psychiatric Institute and assistant clinical professor of psychiatry, Columbia University, was elected president of the American Society of Human Genetics at the annual meeting of the Society in Minneapolis, September 10-12, 1951.

SETON INSTITUTE RESIGNATIONS.—The following medical members of the Medical Advisory Board of the Seton Institute, Baltimore, Md., resigned from the membership in the Medical Advisory Board on September 28, 1951: Drs. Wendell Muncie, Esther Loring Richards, A. Russell Anderson, Manfred L. Guttmacher, Paul V. Lemkau, Jerome Hartz, Henry M. Thomas, Jr., and Frank J. Otenasek.

PENNSYLVANIA PSYCHIATRIC SOCIETY.—At the dinner meeting in Pittsburgh, September 20, 1951, Dr. Henry W. Brosin spoke on "Current Activities at the Western Psychiatric Institute and Clinics." The following officers were elected to serve for the year 1951-52:

President, Dr. Robert H. Israel; president-elect, Dr. Philip Q. Roche; secretary-treasurer, Dr. M. Royden C. Astley. Councillors for one year: Drs. Frederick H. Allen, Arthur P. Noyes, J. Franklin Robinson, and Preston W. Thomas. Councillors for two years: Drs. Herbert H. Herskovitz, John A. Malcolm, and Howard K. Petry. Auditors: for one year, Dr. Lauren H. Smith; for two years, Dr. Mollie E. Orloff; for three years, Dr. John N. Frederick.

BOOK REVIEWS

ATLAS OF ELECTROENCEPHALOGRAPHY. VOL. I (Second Edition). By *Frederick A. Gibbs, M.D.*, and *Erna L. Gibbs*. (Cambridge, Mass: Advisor-Wesley Press, Inc., 1950. Price \$17.50.)

This is the first of a projected 3 volume set by Dr. and Mrs. Gibbs in which they hope to present an atlas of normal and pathological EEGs, for both teaching and reference. This volume presents only normal material and is a full compilation of sample electroencephalograms, asleep and awake, for subjects of all ages. As the authors indicate, no matter how theory and criteria may change, such data as here presented remain valid. A single complaint might be that the material is somewhat less universally useful than it might be in presenting only scalp-to-ear recordings—no scalp-to-scalp tracings are given.

The text offers a brief history of electroencephalography, the physical and physiological backgrounds, and a description of numerous records. The descriptions are good and complete. One might perhaps criticize the physics and physiology as being too schematic for the scientifically sophisticated electroencephalographer. Moreover, Dr. Gibbs seems to insist too much on a favorite thesis of his to the effect that a negative wave always arises at the recording electrode while the positive wave is the result of activity at some distance from the recording electrode. Although this is certainly true for individual nerve fibers as well as for nerve bundles and tracts, it is not generally accepted as true of more complicated architectonic structures such as the cerebral cortex. One factor making for neural synchronization that might have been presented more prominently is nonsynaptic, inductive spread of excitation. One might also raise some question about the technical standards proposed in this book. For example, the electroencephalographer who is responsible for giving the neurosurgeon accurate localization data should have much more precise information about how electrode placements are actually measured so that electrodes placed by different technicians will always fall in the same spots. This is a problem that is neglected too widely and unfortunately the authors do nothing to discourage this neglect.

From the point of view of a psychiatrist, electroencephalographic data presented are poorly exploited in this book. For example, it is noted that regular activity first appears in the electroencephalogram at the age of 2 to 4 months but no note is made of the fact that this is the same time that evidence of conscious recognition first appears to the infant. Also, Dr. Gibbs notes that the low voltage fast record appears for the first time at the age of 13 or 14, but has nothing to say about the psychological implications of this fact. The influence of anxiety and other emotions on the electroencephalogram is alluded to briefly with the aid of a few references

but no attempt is made to explore the fundamental issues. Dr. Gibbs is somewhat uncritical when he refers to the data of Saul, Davis, and Davis as based upon a "Freudian classification of personality." A dichotomization into the passive receptive, on the one hand, and active aggressive, on the other, is hardly a Freudian classification of personality.

The chief fault one finds with this volume is one that is present in so many of Dr. Gibbs' writings, including the first edition of this work. In the text he fails to indicate either directly or indirectly which facts are generally accepted to be true and which are his own personal convictions, not generally shared by other competent electroencephalographers. He implies, and the beginner is likely to be misled by this implication, that his practice and his nomenclature are those in general usage.

Among the controversial issues, one reads that, despite the recommendation of the American Society of Electroencephalography, Dr. Gibbs does not use the scalp-to-ear and scalp-to-scalp terminology, preferring to employ the old, misleading terminology of monopolar and bipolar, even when referring to a nonindifferent electrode such as the ear. Moreover, the beginner would not understand from the text that there are many reputable electroencephalographers who believe that they obtain a great deal of information from scalp-to-scalp leads. Dr. Gibbs seems to prefer collodian fixation of the electrodes to the scalp to the use of Bentonite alone. In all fairness to the reader, he should mention that this preference is not universally shared.

Another statement that many might challenge is that more than twice as much information appears in records obtained during sleep as in the waking state. Certainly, Dr. Gibbs is one of the pioneers in the diagnostic use of sleep records and deserves full credit for this innovation as well as for many other original contributions to the field. But I do not think that it is generally accepted that sleep records are more informative than waking records. In fact, I believe that, in general, a waking record is, if anything, perhaps more than twice as informative as a sleep record. Dr. Gibbs uses the word "energy" just about as loosely as psychiatrists do when they speak of "psychic energy." The voltage and frequency of the waves in the electroencephalogram bear almost no direct relationship to the expenditure of neural energy in the central nervous system or any part of it. The change in voltage recorded in the electroencephalogram is more closely related to patterns of synchronization within the brain than to actual energy expenditure. Another point on which one might take issue with Dr. Gibbs is his insistence that 6 to 8 channels are needed for adequate localization, whereas the American Society of Electroencephalography gives 4 channels as the minimum. It is well known, too, that, although a record with fast activity is con-

sidered abnormal by Dr. Gibbs, many electroencephalographers do not feel that diffuse fast activity is correlatable with cerebral pathology.

However, it should be noted that most of these criticisms are directed toward the text of the *Atlas*. The *Atlas* proper, that is, the collection of samples, is a remarkable piece of work and should without question be available to every electroencephalographer. Many of the descriptive portions of the text are also of similarly high quality and should be available to everyone who does electroencephalography.

MORTIMER OSTOW, M.D.,
New York, N. Y.

LEHRBUCH DER GERICHTLICHEN MEDIZIN. By *Albert Ponsold*. (Stuttgart: Georg Thieme Verlag, 1950. Price: \$11.65.)

This new volume covers the general field of legal medicine and primarily summarizes German experience to date. The subjects presented include chapters on the doctor and the criminal code, court psychiatry, determination of death, establishment of paternity, drunkenness and addiction, determination of health conditions, moral crimes, health insurance, and finally a chapter on the psychology of the different age levels. The coverage of each individual section is relatively comprehensive. Of particular interest is the chapter dealing with legal or court psychiatry, which takes up problems of correction, responsibility of mental illness, civil rights, problems of capacity in relation to business and various commitment situations.

There is a fairly long discussion on the problem of psychopathology including a discussion of basic drives. These summaries, however, contribute little new knowledge to the field. The general problems of criminal psychiatry are quite adequately presented and there is an interesting discussion on punitive responsibilities. The question of reduced accountability as a result of psychiatric disorder, which is a continental notion opposed to the Anglo-Saxon theory of complete responsibility or complete innocence, is of considerable value.

In addition, the author covers specialized legal psychiatric problems taking up under the ordinary nomenclature the typical psychiatric disorders, relating them to criminological situations.

The sections dealing with autopsy technique and post-mortem examinations are of considerable interest, and as usual the German literature presents considerably more information concerning traumatic injuries than the average American text. Here, for example, the excellent discussions showing automobile injuries with skin imprints and the reactive patterns of various types of instrument marks bruising the body with identification of such instruments are extremely important and represent an excellent contribution. The book is illustrated throughout with a number of splendid sketches, and those portraying, for example, ruptured blood vessels, knife wounds, hatchet wounds, etc., are superior to any found in current American texts.

It is impossible in a summary review of this sort to cover the mass of subjects presented in these schematic diagrams, but one can easily say that the book is well worth the price if used for the picture material alone. The use of diagrams is not limited to portrayals of various types of criminal injuries, but carries through in discussions of bullet holes and powder burns, fragmentation patterns, etc.

Altogether the volume is worthwhile, portraying the thoroughness usual to Germanic publications, and undoubtedly heralds a return to the literature of those volumes that so greatly contributed to our knowledge in the past.

DOUGLAS M. KELLEY, M.D.,
Bureau of Criminology,
University of California.

ANALYTICAL GROUP PSYCHOTHERAPY WITH CHILDREN, ADOLESCENTS, AND ADULTS. By *S. R. Slavson*. (New York: Columbia University Press, 1950. Price: \$3.50.)

In this book the author makes an attempt to teach and spread the knowledge of the use of analytic group psychotherapy. It is the latest, and so far, the best exposition in book form of group psychotherapy from a psychoanalytic standpoint.

The book is divided into 15 chapters, 7 of which are utilized in a discussion of the history and the dynamics of group psychotherapy. In discussing the history of group psychotherapy, he mentions a few authors very briefly and goes into details of his own contributions, failing to give credit to the authors on group psychoanalytic therapy of which the literature is voluminous.

In the chapters where he discusses the psychodynamics of group psychotherapy he illustrates by examples of group sessions how the dynamics of transference, identification, etc., takes place. In doing so he uses many new psychoanalytic terms, referring to a glossary. One questions the necessity of the invention of new psychoanalytic terms.

The remaining chapters are devoted to examples of group psychotherapy: cases of pre-adolescents, adolescents, etc. He gives thumbnail sketches of the participants in the groups and cites examples of group sessions, giving a summary of the topics discussed, and ends every discussion by analytic interpretation. The reader is left uninformed as to who does the interpretations. At times these are too cut and dried, like a blueprint. Most of the examples are devoted to extramural work in a social case agency. Owing to his limited experience, very little is mentioned of the work that has been done in hospitals.

The book has a certain value in the field in orientating psychiatrists who are interested in group psychotherapy. The introductory material on analytic therapy is correct, but the case histories do not prove the point, as for example, serving refreshments in some groups and singing songs. This is not psychoanalytic psychotherapy, but pure group therapy of the activity type.

LOUIS WENDER, M.D.,
New York City.

VOCATIONAL REHABILITATION OF PSYCHIATRIC PATIENTS. By Thomas A. C. Rennie, M.D., Temple Burling, M.D., and Luther E. Woodward, Ph.D. (New York: The Commonwealth Fund, 1950. Price: \$0.75.)

This study should be read by everybody who has any interest in the "after care" of the psychiatric patient. It is pointed out in the introductory remarks that "the opportunity and responsibility of the hospital does not stop when the patient leaves the hospital grounds." The authors survey the results of vocational rehabilitation in several series from the material of the states of New York, Connecticut, and Michigan. The methods used vary: some follow-ups were done by direct investigation, others by the means of a "survey form." Legal difficulties are mentioned; for example, vocational rehabilitation bureaus have to follow strict rules (patient should have a favorable prognosis to be eligible for the training program), whereas the philosophy of medical indication may follow different aspects. One should be aware of the fact that active psychotic patients may be able to work, erroneous beliefs of rehabilitation workers new in this field have to be dispelled, and the main problem to gear the program of the state rehabilitation agencies and that of the hospitals is discussed, including the difficulties encountered. Illustrative cases help to point out specific problems.

The most important services required in vocational rehabilitation are, according to the authors, as follows: vocational counseling, vocational training, physical restoration, job finding and placement, and, finally, personal counseling throughout the entire period of rehabilitation plus follow-up until adjustment is complete. The results are evaluated statistically with additional information given in various tables. The reactions of the patients vary according to the authors from highest praise to marked criticism; one of the frequently encountered criticisms stresses the lack of sufficient staff. The referral procedures, vocational counseling, and casework aspects are discussed; the latter appears to be of greatest importance as the proper attitude of the family has to be obtained and similar problems have to be solved before proper work counseling and adjustment can be arranged. The job placement will require the particular skill of the counselor; the problem of breaking down resistance of employers should not be underestimated, but apparently results were encouraging. Rehabilitation staff requirements are discussed, particularly the fact that the counselors have to have understanding of the psychodynamic factors, as well as the sociological implications. The hope is expressed that counselors throughout the country will report on their experiences, and the need for further research and statistical evaluation is stressed.

The reviewer feels that this publication is of great value as it will direct the thinking in dealing with psychiatric patients away from the immediate needs, of course without neglecting them, to sound planning for the future. One may consider arranging for a greater share of "vocational thinking"

for the patient early in his hospitalization even if a part of the avocational aspects of occupational therapy may have to be sacrificed. It is hoped that similar studies will follow as the authors suggested.

BENEDICT NAGLER, M.D.,
McGuire VA Hospital,
Richmond, Va.

THE FOLKLORE OF SEX. By Albert Ellis, Ph.D. (New York: Charles Boni, 1951. Price: \$5.00.)

Looking at a "nonobjective" painting one may wonder if it was so named because one can't think what object the artist could have had in doing it. This book is objective enough, and yet one wonders.

The purpose, the author tells us, was to investigate "American attitudes, feelings, beliefs, and myths on sex, love, and marriage which are normally expressed in our most popular mass media."

These mass media included newspapers, films, Broadway shows, radio and TV broadcasts, magazines, best-selling fiction and nonfiction, popular songs.

Samples of topics covered: promiscuity, prostitution, venereal disease, petting, illegitimacy, birth control, nudity, scatology, "obscenity," incest, "perversions," censorship, puritanism, sex rites and superstitions, and many others.

After wading through a considerable mass of representative contemporary material the author concludes that American attitudes toward sex behavior "are amazingly diverse, conflicting, ambivalent, and confused," and that conservative attitudes possibly "have something of an edge over the liberal ones." Opinions vary from ultraconservative dogmatism such as the Catholic asseveration: "All the physical afflictions that can ensue from the marriage of a [veneerly] diseased person, both to the healthy consort and to the offspring, are an immeasurably lesser evil than one mortal sin which the marriage could avert" (Father Connell), to the ultra-liberal expressions of the joke magazines.

It isn't news that there is the greatest variety of views and beliefs regarding sex matters, many of them directly contradicting others; but the purpose of this book was to furnish the evidence, which it amply does with liberal quotations, and references too, if you care to look them up. One who hasn't been keeping up with all the best sellers and other popular means of communication may be amazed, even disturbed, by the license and extent of sex talk in contemporary literature and entertainment. He will hardly escape the conclusion that the general level of taste is not as high as it might be. On the other hand, anyone interested in popular sexology will find this book a pretty good guide.

All these divergences, oppositions, and extravagances in attitudes you may say are simply the penalty or the advantage (according to your penchant) of democracy; or you may say that they are just another expression of the social disorder of our time. The author doesn't decide.

There is a full bibliography (14 pages) of the various media the author consulted, likewise a detailed name and subject index.

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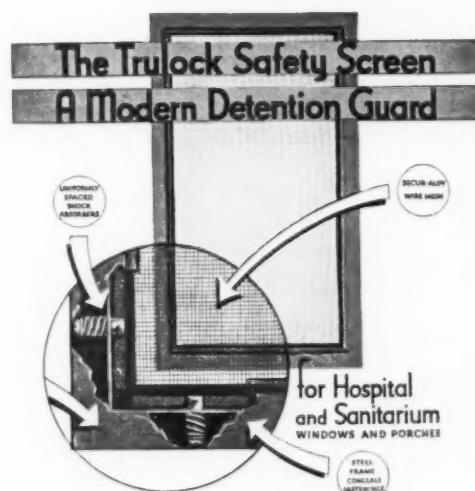
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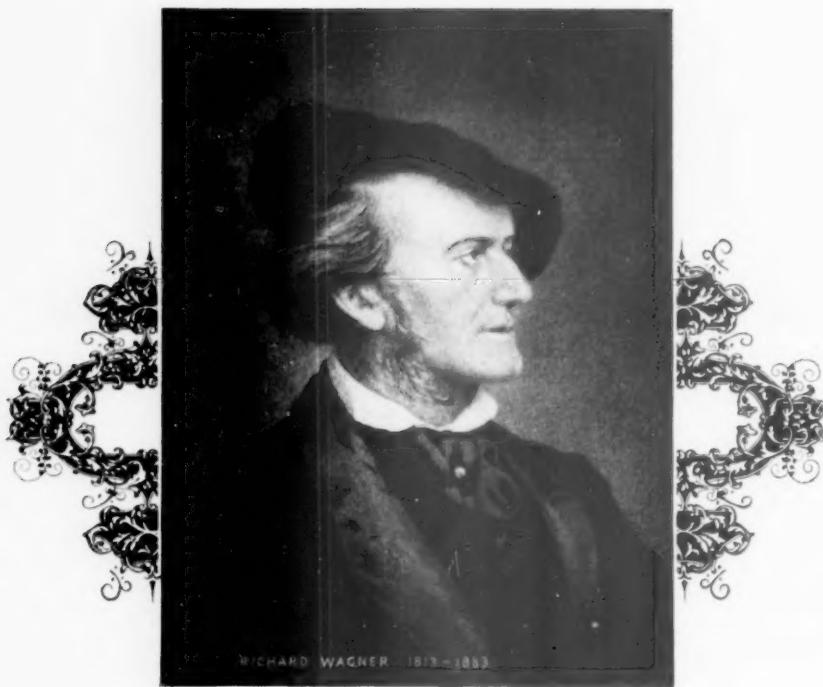
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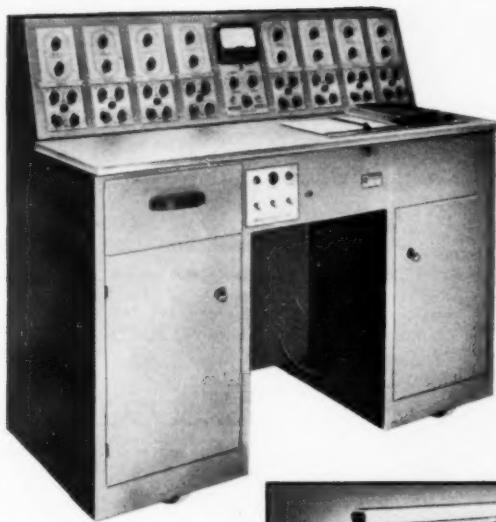
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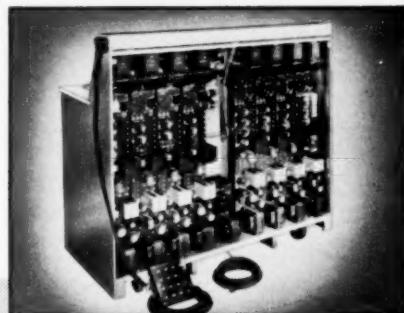
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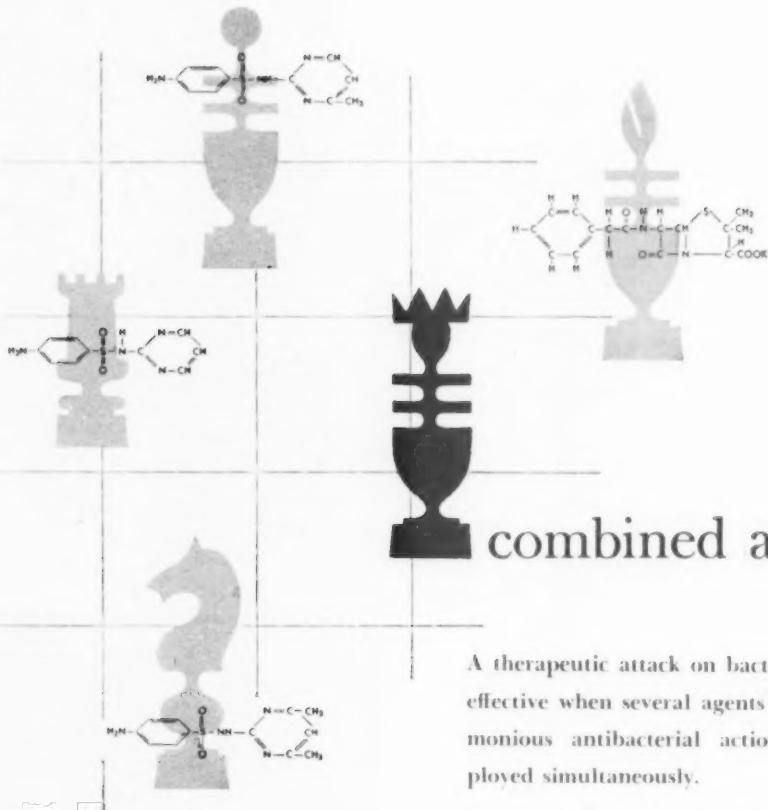
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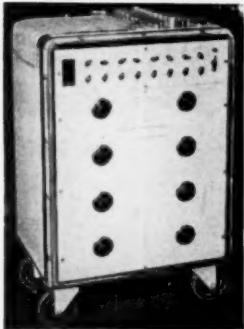


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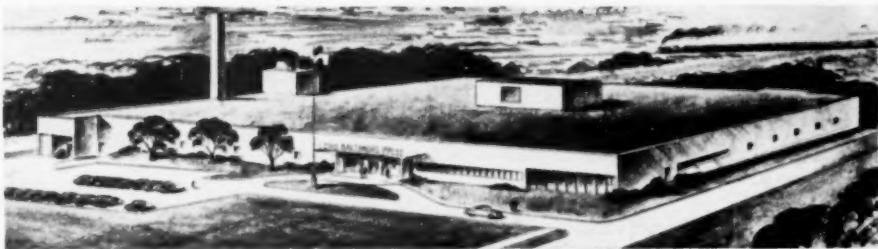
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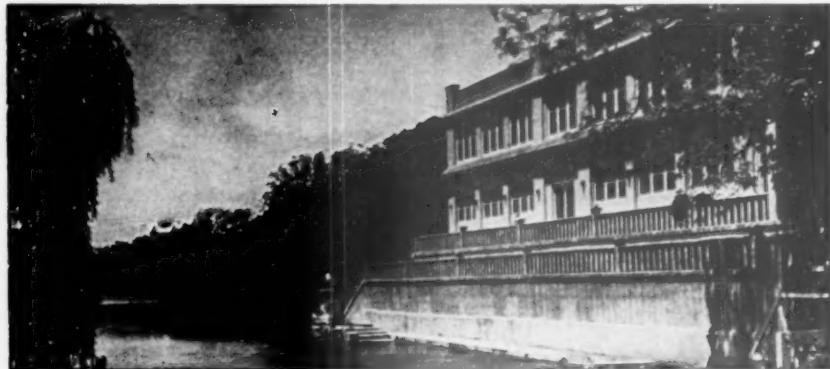
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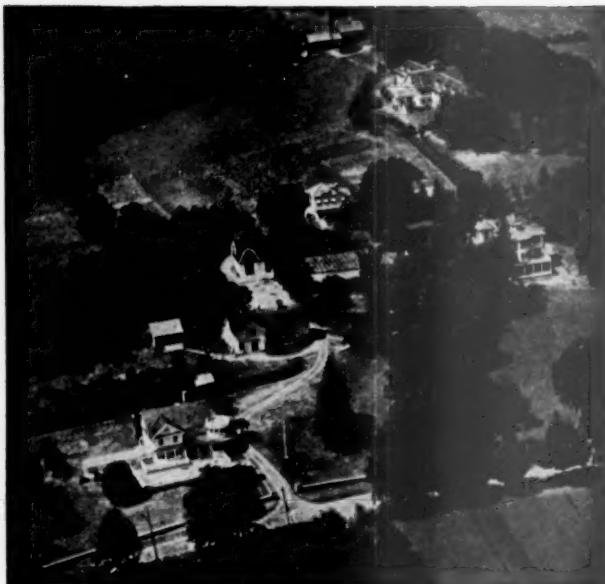
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